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ELECTRIFICATION PROGRAMS AND MATERIALS FOR VOCATIONAL AGRICULTURE, TECHNICAL OCCUPATIONS, AND TRADE AND INDUSTRY TEACHING PROGRAMS AND FOR 4-H ELECTRIC CLUBS.

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FARM ELECTRIFICATION COUNCIL, OAKBROOK, ILL.

PUB DATE 67

EDRS PRICE MF-$0.50 HC-$4.04 99P.

DESCRIPTORS- *BIBLIOGRAPHIES, *ELECTRICITY, *VOCATIONAL AGRICULTURE, YOUTH CLUBS, TEXTBOOKS, REFERENCE MATERIALS, *INSTRUCTIONAL MATERIALS, *TRADE AND INDUSTRIAL EDUCATION, TECHNICAL EDUCATION,

TECHNICAL INFORMATION, TEACHING GUIDES, DEMONSTRATION GUIDES, TEXTBOOKS, HANDBOOKS, BULLETINS, CIRCULARS, CHARTS, SLIDES, AND FILMS ARE INCLUDED IN THE 613 ITEMS OF ELECTRIC AND ELECTRIFICATION TEACHING MATERIALS ASSEMBLED AND EDITED BY SUBJECT-MATTER SPECIALISTS, EDUCATORS, AND STAFF MEMBERS OF THE FARM ELECTRIFICATION COUNCIL. THE MATERIALS ARE ORGANIZED INTO SECTIONS--(1) VOCATIONAL AGRICULTURE, (2) VOCATIONAL-TECHNICAL AND TRADE AND INDUSTRY, (3) 4-H CLUB IN WHICH ITEMS ARE ARRANGED BY STATES, (4) VISUAL AIDS, AND (5) TEXTBOOKS, HANDBOOKS, AND PUBLICATIONS. EACH SECTION HAS A CROSS REFERENCE LIST. THE TITLE, RELATED INFORMATION, EDUCATIONAL LEVEL, SIZE, DATE PUBLISHED, WHEN AVAILABLE, SOURCE, CONTENTS, AND COMMENTS FOR EACH LISTING ARE GIVEN. THIS DOCUMENT IS AVAILABLE FOR $1.00 TO MEMBERS AND $1.50 TO NONMEMBERS FROM FARM ELECTRIFICATION COUNCIL, BOX 1008, OAKBROOK, ILLINOIS 60523. (WB)

AUG 2 8 1967

ED018622

1967 EDITION

# Bibliography of Electrification Education Programs And Materials

Published by

FEC

VT003282

Farm Electrification Council
Box 1008, Oakbrook, Ill. 60523

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# ELECTRIFICATION PROGRAMS AND MATERIALS

for

# VOCATIONAL AGRICULTURE, TECHNICAL OCCUPATIONS, AND TRADE AND INDUSTRY TEACHING PROGRAMS

and for

# 4-H ELECTRIC CLUBS,

Edited by

A. V. Krewatch

1967

Published by
FARM ELECTRIFICATION COUNCIL
Box 1008
Oakbrook, Illinois 60523

# INTRODUCTION

This book is intended as a helpful bibliography of electric and electrification teaching materials, rather than a comprehensive coverage of all farm electrification application and promotional publications and films. The teaching materials listed are the ones prepared for specific purposes and areas of instruction such as Vocational Agriculture, Technical Occupations, Trade and Industry, and 4-H Club Electric Project work. Only a few pertinent references are included that give application (use) information.

Program as used in this Bibliography refers to in-school and out-of-school instruction including factual information, curriculum materials, course outlines, and teaching aids.

Materials include technical information, teaching guides, demonstration equipment ideas, demonstration guides, charts, slides, films, text books, handbooks, bulletins and circulars.

The educational level of each item reviewed is expressed as P, for Primary School; S, for Secondary School; and PS, for Post Secondary School work. The section listing 4-H Club Electric Project program materials uses the standard 4-H Club designations of B, for Basic; I, for Intermediate; and S, for Senior.

The listings under the five main categories are numbered and give the title in capitals, then related information, educational level abbreviations, size, date published when available, and source. This information is followed by a brief paragraph giving contents and comments. The cross-reference list under each teaching category gives only titles, educational level, and indicates source. Refer to the item number for full information in each case.

All items marked with an asterisk (*) are available for review in the Farm Electrification Council library. Items may be borrowed for review without charge by FEC members, or you may visit the library and inspect items of interest. It is located at Room 304, Professional Building, Oakbrook, Illinois.

Since it is quite impossible to reach all sources of helpful and excellent teaching materials, a revision of this Bibliography is planned for an appropriate future time. The Farm Electrification Council will appreciate suggestions for inclusion of missed or new materials, corrections, and deletions of no longer available items. See next page.

We are most appreciative of the help given us by educators at colleges, universities, and technical schools, agricultural engineers, power supplier representatives, state department of education people, and representatives of the United States Department of Health, Education, and Welfare. Special thanks go to Ralph Z. Sorenson who helped with the collecting and reviewing of much of the material and to the Research and Education Committee and staff of the Farm Electrification Council for the original idea and for their guidance.

The Editor

**Please help us!** Tell us where we've erred, and what we've left out in editing this Bibliography.

* * * * * * * * * * *

Just use one of these business reply cards to give us what you know about items incorrectly listed or omitted. Thank you.

The Editor
c/o Farm Electrification Council
Box 1008, Oakbrook, Ill. 60523

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To FEC: Here's an item I recommend for your next Bibliography of Electrification Education Programs & Materials--

Name or title of item_____

_____

What is it? (Slideset, book, manual, or ?) _____

_____

Size_____ Pages_____ Cost_____

Source_____

_____

Comments_____

_____

Nominated by_____

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Size_____ Pages_____ Cost_____

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Additional copies of this publication may be ordered from:
Farm Electrification Council
Box 1008, Oakbrook, Ill. 60523

Price: To members of Farm Electrification Council.....$1.00
To non-members of Farm Electrification Council....$1.50

# ELECTRIFICATION PROGRAMS AND MATERIALS

## Vocational Agriculture Electric Program

### Technical Electrification Teaching Materials

1. *FARM ELECTRIFICATION HANDBOOK for Teachers of Vocational Agriculture, I. C. Cowart, Subject Matter Specialist, S, PS, 8 1/2 x 11, 49 pp., 1965, State Department of Education, Baton Rouge, La.

This handbook contains the technical information for seven lessons; introduction, terms, wire sizes, how power is wasted, fuses and breakers, wiring practices, and service entrances. It suggests steps in developing a teaching plan and gives questions and answers.

2. *FARM ELECTRICITY, I. C. Cowart, Subject Matter Specialist, S, PS, 8 1/2 x 11, 30 pp., 1965, State Department of Education, Baton Rouge, La.

This reference and teaching guide is a companion to Item 1, Farm Electrification Handbook for Teachers of Vocational Agriculture. It is organized in lessons and gives problems, answers, and explanations.

3. *GUIDE FOR TEACHING PRACTICAL ELECTRICITY, for Farm and Home, Farm Service Department of the Ohio Edison Company, S, PS, 8 1/2 x 11 spiral bound, 150 pp., 1964, Ohio Edison Company, Akron, O.

This teaching guide is arranged to be used with an electrical demonstration board. Charts, diagrams, photographs and references cover electricity, definitions, wiring, planning, motors and controls, standards, and quality ratings. It is approved by Kent State, Ohio State, Ohio State Department of Education and Ohio Vo-Ag Teachers Association.

4. *ADEQUATE WIRING, Instructors Guide, Arkansas Rural Electrification Council and State Department of Education, S, PS, 8 1/2 x 11, 61 pp., 1960, State Department of Education, State Education Building, Little Rock, Ark. 72201.

The teaching guide gives information and facts that will help in preparing for teaching adequate wiring. This information is designed to acquaint students with present and future problems in wiring systems. The material is divided into three parts: terminology, understanding, planning and practical residential wiring. The parts are divided into jobs and jobs are divided into--objectives, information for teachers, materials, references, teacher activities and student practice.

5. *TEACHING ELECTRICITY IN VOCATIONAL AGRICULTURE, Curtis R. Weston in cooperation with Agricultural Education Department and State Department of Education, P, S, PS, 8 1/2 x 11 litho., 25 pp., 1966, Department of Agricultural Education, University of Missouri, 122 Waters Hall, Columbia, Mo. 65201.

(More on this item on next page)

A suggested procedure and course outline for teaching electricity to vo-ag students, young farmers, and adult farmer classes covers understanding electricity, basic electrical terms, magnetism and electromagnetic induction, wire sizes and types, principles of wiring switches and circuits, circuit protection, selection, care and operation of electric motors, and planning the farmstead wiring.

6. *SELECTION, OPERATION, AND MAINTENANCE OF ELECTRIC MOTORS, Teaching unit, Thomas A. Hoerner, Agricultural Education Department, S, PS, 8 1/2 x 11 paper cover, 41 pp., 1966, $0.20, Agricultural Education Department, The Pennsylvania State University, University Park, Pa. 16802

This teaching unit for vocational agriculture students contains unwired diagrams, questions, teaching guidance, laboratory work sheets, and instructional information.

7. *ELECTRIC MOTORS FOR THE FARM, Suggestions for teaching, S, PS, 8 1/2 x 11 booklet, 55 pp., 1965, $2.00 (members--$1.50) Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017.

The lesson plans in this booklet have been prepared to assist vocational agricultural teachers in carrying out an instructional program that will meet the needs of in-school students, young farmers, and adult farmers in the selection, use, protection, and care of farm motors.

8. *AIDS TO USING ELECTRICITY ON INDIANA FARMS, Harry W. Leonard and Paul E. Johnson, Purdue University, Department of Agricultural Education and Agricultural Engineering, respectively, P, S, PS, 8 1/2 x 11, 57 pp., 1964, R. A. McKinney, State Supervisor, Agricultural Education, 600 Old Trails Building, 5309 West Washington Street, Indianapolis, Ind.

This guide book provides a busy teacher with accurate information for use with his classes. The units are not designed to serve as lesson plans, allowing the teacher to do his own planning, but do cover the more important points which must be considered in using electricity on the farm.

9. *LESSONS IN FARM ELECTRIFICATION, E. F. Olver, R. N. Jones, D. R. McClay, and F. Anthony, S, PS, 6 x 9, 40 pp., 1954, $0.35, College of Agriculture, Pennsylvania State University, University Park, Pa. 16802.

This booklet is prepared to guide teachers of vocational agriculture and others in organizing and teaching classes on electrification. It details eight basic lessons with teaching aids, and lists reference material and films.

10. *PRACTICAL EXERCISES WITH ELECTRICITY AS USED ON THE FARM, S, PS, 8 1/2 x 11 paper, 44 pp. plus question and answer sheets, 1965, Wisconsin Electric Power Company, 231 West Michigan Street, Milwaukee, Wis. 53201.

This is a laboratory manual in practical electricity as it is used on the farm, and a workbook for students in vocational agriculture. It outlines and diagrams nineteen different exercises ranging from making a test lamp to motor maintenance. To accompany it is a set of work sheets for each exercise and a set of answer sheets.

11. *FARM ELECTRIFICATION STUDY MANUAL FOR VOCATIONAL AGRICULTURAL STUDENTS, Agricultural Education Department, University of Arizona, S, PS, 8 1/2 x 11 spiral binder, 40 pp., 1958, State Department of Vocational Education, 412 Arizona State Building, Phoenix, Ariz.

This standard manual covers basic electricity, electrical terms, procedures for figuring operating costs, safe usage, planning installations, National Electric Code, selecting wire sizes and types, simple wiring, planning the distribution system and selecting and installing electric motors. A 45-page instructors manual is available to accompany the student manual.

12. *FARM ELECTRIFICATION TEACHING MANUAL FOR VOCATIONAL AGRICULTURAL INSTRUCTORS, Agricultural Education Department, University of Arizona, S, PS, 8 1/2 x 11 spiral binder, 45 pp., 1958, State Department of Vocational Education, 412 Arizona State Building, Phoenix, Ariz.

This instructors manual is designed for use with students manual from same source. It covers basic electricity, electrical terms, procedures for figuring operating costs, safe usage, planning installations, National Electric Code, selecting wire sizes and types, simple wiring, planning the distribution system and selecting and installing electric motors.

13. *FARM AND HOME ELECTRIC WORKBOOK, S, PS, 8 1/2 x 11 spiral binder, 59 pp., 1965, Iowa Association of Electric Cooperatives, 323 University Avenue, Des Moines, Ia.

This workbook gives a fair balance between actual classroom and lecture time. It includes charts, diagrams, photographs and reference materials. It gives information for both student and instructor covering fundamentals, wiring, and motors.

14. *ELECTRIC PROGRAM FOR FARM AND HOME, Students Manual, a companion to Item 15, P, S, 8 1/2 x 11 mimeo., 30 pp., 1965, Iowa Southern Utilities Company, 300 Sheridan Avenue, Centerville, Iowa 52544.

The study program and exercises cover fundamentals of electricity and magnetism, basic wiring circuits, residence and farmstead wiring, building a wiring board and an electric motor laboratory.

15. *ELECTRIC PROGRAM FOR FARM AND HOME, Instructors Manual, a companion to Item 14, P, S, 8 1/2 x 11 mimeo., 54 pp., 1965, Iowa Southern Utilities Company, 300 Sheridan Avenue, Centerville, Iowa 52544.

The instructors manual includes teaching fundamentals of electricity and magnetism, laboratory exercises on basic wiring circuits, residence and farmstead wiring, student wiring board, motor maintenance, cost of materials for laboratory exercises and making electric motor laboratory. Reference books are needed.

16. *ELECTRIC MOTORS FOR FARM USE, S, PS, 8 1/2 x 11 printed, 53 illustrations, 30 pp., 1965, $0.35, Vocational Agriculture Service, College of Agriculture, University of Illinois, Urbana, Ill. 61801.

(More on this item on next page)

This text and laboratory guide used by vocational agriculture teachers in Illinois was prepared to accompany the electric motor kit. The kits are jointly sponsored by the Vocational Agriculture Service and the Illinois Farm Electrification Council. This booklet is good even without the kit.

17. *ELECTRICAL CONTROLS KIT MATERIALS, four items, developed in cooperation with the Illinois Farm Electrification Council, S, PS, 8 1/2 x 11, University of Illinois, Vocational Agriculture Service, 434 Mumford Hall, Urbana, Ill. 61801.

1--APPLYING ELECTRICAL CONTROLS IN FARM PRODUCTION, 10 pp., printed, $0.05 plus postage. This is a guide to be used with the motor controls kit designed to teach a student the fundamentals and characteristics of many kinds of motor controls and to apply this knowledge in practical work exercises.

2--SUGGESTIONS TO THE TEACHER in using the electrical controls kit, 8 pp., single copy free with each order. This item gives suggestions for using the electrical controls kit and supplies the answers to the questions which are asked in the exercises developed for use with this kit. See Exercises for use with electrical controls kit, item 17-3, below.

3--EXERCISES FOR USE WITH ELECTRICAL CONTROLS KIT, 45 pp., $0.20 plus postage, 1966. A series of 17 exercises are given to be used with the electrical controls kit developed by the University of Illinois in conjunction with the Illinois FEC. It lists equipment needed for teaching each exercise and the procedures together with questions to be answered by the students.

4--SLIDE FILM, unpacking, checking, and identifying electrical items, 68 frames, black and white, $1.21 plus postage. This slide film is useful when unpacking and checking items contained in the Vocational Agricultural Service electrical loan box. It is also helpful in teaching identification of commonly used electrical terms.

18. *ELECTRICAL CONTROL WORKSHOP, S, PS, 8 1/2 x 11, 72 pp., 1965, write for cost information, The Potomac Edison Company, 55 East Washington Street, Hagerstown, Md. 21740.

This material is designed to give the vocational agriculture teacher and his students a better understanding of the operation of electrical controls. These lessons are based on the electrical controls course developed by the University of Illinois and the Illinois Farm Electrification Council.

19. *FARM ELECTRIFICATION, suggestions for teaching, Bulletin 558, (revised), S, PS, 8 1/2 x 11, 56 pp., 1960, Texas Education Agency, Austin, Tex. 78700.

Each of five lessons included is designed to be given in a 90-minute period. They cover introduction to farm electrification, common electrical terms, simple electric circuits and common wiring materials, selection of proper wire sizes, circuit protection, and practice wiring. Also included are suggested steps in developing a vocational agriculture teaching plan and materials needed for a demonstration board.

20. *FARM ELECTRIFICATION FOR VOCATIONAL AGRICULTURE, three items, Farm Electrification Council and the New Jersey Department of Education, P, S, 8 1/2 x 11 multilith, New Jersey Department of Education, Vocational Division, 225 West State Street, Trenton, N. J. 08625.

Book I, P, 32 pp., 1962. This book covers basics of electricity in a non-technical manner with simple exercises for the student to perform.

Book II, S, 96 pp., 1963. This second book was prepared for sophomore vocational agriculture students. The objective is to develop an understanding of the safe and practical use of electricity on the farm. It does not duplicate general science and high school physics courses.

Book III and IV, S, 45 pp., 1964. The third book deals with agricultural uses of electricity for the production of heat, light, and power for farm use. It includes particular applications for dairy, poultry, and horticulture.

21. *SUGGESTIONS FOR TEACHING FARM ELECTRIFICATION, EEI Publication #61-226, Example lessons, S, PS, 8 1/2 x 11, 52 pp., 1961, $1.50, Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017.

This publication is divided into five lessons and each lesson into six suggested teaching steps to assist in preparing effective, workable teaching programs. Included are introduction to farm electrification, common electrical terms, simple electrical circuits and common wiring materials, selection of proper wire sizes and circuit protection, and practice wiring.

22. *ELECTRICAL WIRING FUNDAMENTALS AND PLANNING, S, PS, 24 pp., 1965, up to 999 pp. 1¢ per page, 1,000 or more pages 3/4¢ per page plus shipping, Vocational Agriculture Service, College of Agriculture, University of Illinois, Urbana, Ill. 61801.

This punched page booklet covers fundamentals of electricity, safety, and adequacy, selecting wiring materials and devices, and planning the farm wiring system. It is a companion piece to Item 23, Electrical Wiring Procedures and Exercises, from the same source.

23. *ELECTRICAL WIRING PROCEDURES AND EXERCISES, S, PS, 8 1/2 x 11, 32 pp., printed, 1965, up to 999 pages 1¢ per page, 1,000 or more pages 3/4¢ per page plus shipping, Vocational Agriculture Service, College of Agriculture, University of Illinois, Urbana, Ill. 61801.

This punched page booklet covers bringing electrical service to a building, bringing it into a building, installing various interior wiring electrical services, and wiring exercises. This is a companion piece to Item 22, Electrical Wiring Fundamentals and Planning, from same source.

24. *ELECTRICAL HAZARDS ON THE FARM, P, S, PS, 8 1/2 x 11, 12 pp., 1965, up to 999 pages 1¢ per page, over 1,000 pages 3/4¢ per page, Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Ill. 61801.

(More on this item on next page)

This punched page booklet gives information on specific causes of farm electrical hazards, factors contributing to electrical hazards, grounding, first aid for treatment of electrical injuries, fighting electrical fires, circuit survey, and farm electrical hazard checklist.

25. *FARM ELECTRIFICATION, Potomac Edison System Staff, S, PS, 8 1/2 x 11, 80 pp., 1965, write for information on availability and cost, The Potomac Edison Company, 55 East Washington Street, Hagerstown, Md. 21740.

This lesson plan manual presents 13 farm electrification demonstration lessons for teaching electrical terms, circuits, wiring materials, effect of size of wire on the operation of equipment, protection, and farm wiring design. It is complete with photographs, charts, diagrams, and tables and coordinates the information with the use of a wiring demonstration board.

26. *ELECTRICAL WIRING INFORMATION BOOKLET, S, PS, 8 1/2 x 11 litho., 13 pp., 1966, The Connecticut Light and Power Company, Farm Service Dept., P. O. Box 2010, Hartford, Conn. 06101.

This teaching aid was designed for use with a "Wire Sample Board". It covers wire types, wire sizes, insulation of conductors, selection of proper wire sizes, and is complete with tables from the 1962 edition of National Electrical Code.

27. *FARM ELECTRIFICATION, Learning To Do by Doing, P, S, 8 1/2 x 11, 42 pp., printed, Central Power and Light Company, P. O. Box 2121, Corpus Christi, Tex. 78403.

This Future Farmers of America booklet is published annually in connection with their awards program and covers fundamentals of electricity, skills in using electricity, projects in electricity, exhibits, demonstrations, and the awards program for students.

28. *ADULT FARM ELECTRIFICATION COURSE, Central Maine Power Company, PS, 8 1/2 x 11, approx. 50 pp., 1964, Central Maine Power Company, 9 Green Street, Augusta, Me. 04330.

A series of ten lesson plans designed to acquaint the adult farmer with some of the basic principles of electricity and a good farmstead wiring system.

29. *ELECTRICAL CONTROLS FOR THE FARM, S, 8 1/2 x 11, 18 pp., 1964, free to teachers in Alabama, Alabama Power Company, Box 2641, Birmingham, Ala. 35200.

This is a program for vocational agriculture teachers and includes switches, sensing devices, relays, motor control devices, and diagrams on line voltage switching, electrical relays, and motor control.

30. *ADULT FARMER EDUCATION IN VOCATIONAL AGRICULTURE, PS, 8 1/2 x 11 mimeo., 16 pp., 1963, State Board of Education, Raleigh, N. Ca. 27600.

Areas covered in this course include fundamentals of electricity, installation, and minor repair of conveniences, electric motors, and economics for electrical use.

*. Indicates items that are in FEC Library

31. *FARM ELECTRIFICATION COURSE, S, PS, 8 1/2 x 11, 12 pp., limited availability, first copy free, Farm Sales Department, Connecticut Light and Power Co., P. O. Box 2010, Hartford, Conn. 06101.

This ten meeting, two hours per meeting course is designed to be used with adult and young farmers as an evening program. It can be helpful to a person planning a similar type course.

32. *ELECTRICAL FUNDAMENTALS BOOKLET, Edward S. Pira, Assistant Professor, Agricultural Engineering, College of Agriculture, P, S, PS, 8 1/2 x 11, 46 pp., 20 illustrations, $0.55 per copy, University Book Store, Student Union Building, University of Massachusetts, Amherst, Mass. 01002.

Here is a booklet that deals with the fundamentals of electricity with no attempt made to show some of the complicated equipment as it actually exists. Also, many of the forces and variables that affect electrical output in one way or another are not included. The booklet is recommended for use with the demonstrations described in the paper "Educational Aids for Youth", Item 330. A free copy is available by writing to Mr. Pira.

33. *VOCATIONAL AGRICULTURE COURSE IN ELECTRICITY, Tennessee Department of Education in cooperation with TVA, 4 units, S, PS, 8 1/2 x 11, Vocational Curriculum Laboratory, Box 1114, Murfreesville, Tenn. 37130.
Unit 1 -- Fundamentals of Electricity, 9 pp.
Unit 2 -- Wiring and Materials, 33 pp.
Unit 3 -- Farm Motors, 19 pp.
Unit 4 -- Electric Controls, 19 pp.

These unit outlines give detailed lists of demonstration equipment and materials, and references. They are well illustrated.

Educational level code:
P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

Cross Reference Items -- see these Numbers

under VO-TECH and TRADE & INDUSTRY:

101. Applied Electricity, S, PS, College of Education, Columbia, Mo.

103. Fundamentals of Electricity, S, PS, Department of Trade and Industrial Education, University of Alabama, University, Ala.

104. Industrial Electricity, S, PS, Department of Trade and Industrial Education, University of Alabama, University, Ala.

105. Curriculum Materials, S, PS, U. S. Government Printing Office, Washington, D. C.

## Vocational Agriculture Electric Program

### Electrification Course Outlines and Guides

71. *AGRICULTURAL MECHANICS INSTRUCTION, Organization of Laboratory Work Areas, G. G. Powell, Jr., State Department of Education, G. M. Walker, Agriculture Education, Mississippi State University, S, PS, 8 1/2 x 11, 52 pp., 1964, Division of Vocational and Technical Education, Department of Education, State of Mississippi, P. O. Box 771, Jackson, Miss. 39205.

Included is a short and simple 4-page list and teaching outline, showing tools and equipment needed in eight areas including a chapter on electricity and on welding. The outline covers a specific activity to be performed to develop skills, and sets forth the outcomes expected to be accomplished.

72. *SELECTED TEACHING PLANS IN FARM ELECTRIFICATION, Charles O. Smith, former teacher of agriculture, S, PS, 8 1/2 x 11, 1965, single copy free, Rural Education Department, New York State College of Agriculture, Cornell University, Ithaca, N. Y. 14850.

The selected teaching plans cover understanding of electrical fundamentals, grounding and safety in electrical use, circuit protection, planning a distribution center, labor saving equipment, using related agencies and services, maintaining and servicing electrical motors, and planning an adequate ventilation system for a dairy barn. The course outline is in classroom teaching detail, giving both analysis and teaching procedures.

73. BASIC ELECTRICITY, 18 Lesson Course (Correspondence), S, PS, $48.00, Graduate School, United States Department of Agriculture, Washington, D. C. 20250.

This USDA Graduate School Correspondence Course is primarily for employed people. No previous knowledge of electricity is required. Basic mathematics or equivalent is desirable.

74. BASIC ELECTRONICS, 16 Lesson Course (Correspondence), S, PS, $42.00, Graduate School, United States Department of Agriculture, Washington, D. C. 20250.

This USDA Graduate School Correspondence Course is primarily for employed people. Completion of the Basic Electricity Course is highly desirable.

75. VOCATIONAL AGRICULTURE, Teaching Guides, Wall Charts, P, S, PS, 8 1/2 x 11 guides, 10 copies, $13.50/yr., write for quantity prices, Successful Farming Circulation Company, 1716 Locust Street, Des Moines, Ia. 50303.

Each is a summary of one selected Successful Farming article. The guide has questions for discussion, references, and suggested ideas. The wall charts are a part of the teaching kit, and the material is all part of a currently issued teaching program. From time to time, electrical application information is included.

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* Indicates items that are in FEC Library

76. *ELECTRICAL TIPS FOR EVERYONE, Correspondence Course No. 152, S, PS, 1963, $2.75 per single copy, over 5 copies $2.25 per copy, Department of Agricultural Education, The Pennsylvania State University, 202 Agricultural Education Building, University Park, Pa. 16802.

The course covers: how to avoid an electrical crisis, figuring the cost of electricity, let's inspect that outside wiring, keeping shock hazards out of electrical systems, meet your electric motors, brains for electrical appliances and equipment, do-it-yourself jobs--procedures and examples, seeking and using professional help, and diagnosing and solving electrical problems. The cost includes correcting, grading, and returning the question papers.

Cross Reference Items -- See these Numbers

under VO-TECH and TRADE & INDUSTRY:

151. Electrical Trades, S, PS, The University of the State of New York, N. Y.

156. Bulletin of North Georgia Technical and Vocational School, S, PS, Clarksville, Ga.

158. Apprentice Inside Wiremen, S, PS, Wisconsin Board of Vocational, Technical, and Adult Education, Madison, Wisc.

162. Electrical and Electronic Technologies, S, PS, United States Government Printing Office, Washington, D. C.

165. Lighting Fundamentals Course, S, PS, Illuminating Engineering Society, N. Y.

166. Course of Study Outline, S, Sussex County Vocational-Technical Center, Georgetown, Dela.

167. Electricity and Electronics, Self study course, S, PS, General Electric Company, nearest General Electric Major Appliance Distribution House.

Educational level code:
P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Demonstration Boards and Work Kits:

301. Farm Electrification Teaching Aids, S, PS, The Dayton Power and Light Company, Dayton, Ohio.

302. Suggestions for Teaching Farm Electrification, S, PS, Carolina Power & Light Company, Raleigh, N. Ca.

303. Practical Farm Wiring Demonstrations, S, PS, Department of Agricultural Education, University of Missouri, Columbia, Mo.

305. An Electric Work Center, S, PS, The Pennsylvania State University, University Park, Pa.

306. Demonstrations in Farm and Home Lighting, P, S, College of Education, Michigan State University, East Lansing, Mich.

307. Lighting Demonstrations Using "KIIFEUC" Lighting Kits, P, S, PS, Kansas State University, Manhattan, Kan.

308. Demonstration Manual, PS, Cooperative Extension Service, Ohio State University, Columbus, O.

309. Electrical Demonstration Center, S, PS, Vermont Department of Education, Montpelier, Vt.

310. Demonstration Manual, S, PS, Cooperative Extension Service, Kansas State University, Manhattan, Kan.

311. Fundamentals of Electricity Demonstration, P, S, Connecticut Light and Power Company, Hartford, Conn.

313. Selected Teaching Demonstrations in Agricultural Mechanics, S, Agricultural Education, New York State College of Agriculture, Ithaca, N. Y.

314. Battery Charger Kit, S, Agricultural Engineering Department, University of Connecticut, Storrs, Conn.

315. Electric Demonstration Kit, S, PS, Electro-Tech, Inc., Hapeville, Ga.

316. Project Materials, P, S, Edison Electric Institute, New York, N.Y.

319. Voltage-Tester-110-220, S, Agricultural Extension Service, University of California, Berkeley, Calif.

321. Electrical Projects, P, S, Lyon Rural Electric Company, San Diego, Calif.

323. Working With Light, S, Better Light Better Sight Bureau, New York, N. Y.

326. Electrical Projects for Farm Youths, P, S, New England Power Service Company, Clinton, Mass.

328. Experimenting with Electricity, P, S, Alabama Power Company, Birmingham, Ala.

330. Educational Aids for Youth, P, S, PS, Agricultural Engineering Department, University of Massachusetts, Amherst, Mass.

331. Projection Meters, for use with overhead projector, Central Scientific Company, Mountainside, N. J.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Charts

351. Generation, Transmission, and Distribution of Electricity, P, S, Alabama Power Company, Birmingham, Ala.

352. Lead Type Storage Battery, parts and operation, P, S, PS, Electric Storage Battery Company, Philadelphia, Pa.

353. Electric Projects for Farm Youth, P, S, Edison Electric Institute, New York, N. Y.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Movie Films

361. Adequate Wiring, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

362. Automatic Controls, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

363. Mechanical Poultry Equipment, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

364. Hog Feeding, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

365. Materials Handling For A Beef Layout, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

366. Materials Handling For A Dairy Layout, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

367. The Wonder-Filled Age of Electricity, P, S, PS, 20 minutes, color, National Electrical Manufacturers Association, New York, N. Y.

368. Electricity at Work, S, PS, color, sound, 15 minutes each, Dept. of Agricultural Engineering, Michigan State University, E. Lansing
   1. Putting Electrons To Work
   2. Understanding Volts, Amperes, and Ohms
   3. Using Ohm's Law to Understand Circuits
   4. Watts, Watthours, Watthour Meters
   5. Mechanical Generation of Electricity
   6. How Transformers Work
   7. The 120/240 Volts-3 Wire System
   8. Understanding Branch Circuits
   9. Understanding Common Induction Motors
   10. Starting Characteristics of Common Induction Motors

369. Farm Better Electrically, S, PS, 27 minutes, Edison Electric Institute, New York, N. Y.

371. Principles of Electricity, S, PS, 20 minutes, General Electric Educational Films, New York, N Y.

372. A Is for Atom, 15 1/2 minutes, General Electric Educational Films, New York, N. Y.

373. Electrical Safety in the Home, P, S, PS, color, Stout State University, Menomonie, Wis.

374. My Pop's A Lineman, P, S, PS, color, Stout State University, Menomonie, Wis.

375. Electric Citcuits, P, B/W, McGraw-Hill Book Company, New York.

376. Our World of Electricity, P, five films, Cenco Educational Films, Chicago, Ill.

377. Farm Mechanization Electrically, S, PS, color, Iowa State University, Ames, Io.

378. Matter and Energy, three films on electricity, P, color, Encyclopaedia Britannica Educational Corporation, Chicago, Ill.

379. Electricity and Magnetism, five films, S, B/W, Encyclopaedia Britannica Educational Corporation, Chicago, Ill.

380. Electricity-Distribution, S, PS, color, Indiana University, Bloomington, Ind.

381. Electricity-Measurement, S, PS, color, B/W, Indiana University, Bloomington, Ind.

382. Electricity-Static Electricity, S, PS, color, B/W, Indiana University, Bloomington, Ind.

383. Electricity-Production, S, PS, color, B/W, Indiana University, Bloomington, Ind.

384. Electricity-From Power Plant To Home, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

385. Electromagnets, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

386. The Flow of Electricity, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

<u>Cross Reference Items</u> -- See these Numbers

under VISUAL AIDS: Filmstrips

401. Farm Electric Motors, Selection, Protection, and Drives, S, PS, 68 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

402. How Farm Electric Motors Start and Run, S, PS, 86 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

403. Electrical Terms--Their Meaning and Use, P, S, 89 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

404. Understanding Electricity, P, S, Society for Visual Education, Inc., Chicago, Ill.
- 412-1 How Radio and Radar Work, 59 frames, 14 minutes.
- 412-2 How Electricity Is Produced, 61 frames, 14 minutes.
- 412-3 Producing Static Electricity, 59 frames, 13 minutes.
- 412-4 Electric Circuits and How They Work, 58 frames, 6 to 12 1/2 minutes.

405. Electric Circuits, P, S, 57 frames, Society for Visual Education, Chicago, Ill.

406. The Principles of Electric Motors and Generators, P, S, 68 frames, Society for Visual Education, Chicago, Ill.

407. Learning Arc Welding Skills, S, PS, set of three, James F. Lincoln Arc Welding Foundation, Cleveland, O.

408. Diagraming Electrical Wiring Circuits, S, PS, 54 frames, B/W, University of Illinois, Urbana, Ill.

409. Unpacking, Checking, and Identifying Electrical Items, S, PS, 68 frames, B/W, University of Illinois, Urbana, Ill.

410. Electrical Welding, Learning and Applications, S, PS, six filmstrips, B/W, University of Illinois, Urbana, Ill.

411. DC and AC Motor Theory, Testing, Connecting, and Trouble Shooting, S, PS, four filmstrips, B/W, University of Illinois, Urbana, Ill.

412. Basic Electricity, P, S, twelve filmstrips, B/W, The Jam Handy Organization, Detroit, Mich.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Slides, Overhead Projector Transparencies

451. The Electrification Farm Story, S, PS, Edison Electric Institute, New York, N. Y.

452. Fundamentals of Electricity, S, PS, Michigan State University, East Lansing, Mich. Items used as teaching aids:
   1. Putting Electrons to Work
   2. Mechanical Generation of Electric Power
   3. How A Transformer Works
   4. Common Induction Motors: Types and Their Differences

453. Electricity for Home and Agricultural Use, S, PS, North Dakota State University, Fargo, N. D.

454. Milk House Score Card, S, PS, The Pennsylvania State University, University Park, Pa.

455. What Is Your C-A-S-E with Electricity? S, PS, Department of Education, Pennsylvania State University, University Park, Pa.

456. Electricity Series, transparencies for the overhead projector, S, PS, eleven units, Keuffel & Esser Company, local branches or Hoboken, N. J.

457. How Electricity Performs, S, PS, electrical understanding, 6 sets, Michigan State University, East Lansing, Mich.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Textbooks and Booklets

501. Electrical Terms, Their Meaning and Use, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

502. Fundamentals of Electricity and Magnetism, P, S, PS, Delco-Remy Division of General Motors Corporation, Anderson, Ind.

503. Living with Electricity, P, S, PS, Dayton Power and Light Company, Dayton, O.

504. Aids to Using Electricity on Indiana Farms, S, PS, Purdue University, Lafayette, Ind.

505. Basic Electricity and An Introduction to Electronics, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

506. ABC's of Electricity, P, S, Howard W. Sams and Company, Inc., Indianapolis, Ind.

507. Practical Science Projects in Electricity/Electronics, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

508. Interior Electric Wiring, Residential, S, PS, American Technical Society, Chicago, Ill.

509. Interior Electric Wiring, Residential, S, PS, Study Guide, American Technical Society, Chicago, Ill.

510. Electrician's Examinations, Questions and Answers, PS, Theodore Audel and Company, Indianapolis, Ind.

511. Electric Science Dictionary, S, PS, Theodore Audel and Company, Indianapolis, Ind.

513. Programmed Basic Electricity Course, P, S, PS, Theodore Audel and Company, Indianapolis, Ind.

514. Instructional Materials for Trade, Industrial, and Technical Occupations, S, PS, Instructional Materials Laboratory, Columbus, O.

515. Selected References and Aids Useful in Teaching Agricultural Mechanics, Agricultural Education Department, New York State College of Agriculture, Ithaca, N. Y.

516. Farm Electrification, Brown, S, PS, McGraw-Hill Book Company, New York, N. Y.

517. ABC's of Electric Motors and Generators, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

518. Learning Electricity Fundamentals, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

519. Electrical Textbook for Farming and Home-Making, S, PS, South Dakota Rural Electric Association, Inc., Huron, S. D.

520. Using Electricity on the Farm, Hamilton, S, Prentice-Hall, Inc., Englewood Cliffs, N. J.

521. Practical Electric Wiring, Richter, S, PS, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Handbooks, Manuals, and Guides

551. Wiring Specifications for Electrical Farm Equipment, S, PS, Cornell University, Ithaca, N. Y.

552. Farm Wiring Systems, S, PS, Iowa Southern Utilities Company, Centerville, Iowa.

553. Farmstead Wiring Handbook, S, PS, Farm Electrification Council, Oakbrook, Ill.

554. Simplified Electric Wiring Handbook, S, PS, Sears, Roebuck and Company, local.

556. Maintaining the Home Lighting and Wiring System, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

557. Farm Electric Motors, Selection, Protection, Drives, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

558. Introduction to Electric Motors, S, PS, Potomac Edison Company, Hagerstown, Md.

559. Care of Electric Motors, A Guide, S, PS, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

560. Protection Handbook, Based on 1962 Code, S, PS, Bussmann Manufacturing Division of McGraw-Edison Co., St. Louis, Mo.

562. Electrical and Basic Controls Used in Agriculture, Teaching Suggestions, S, PS, Edison Electric Institute, New York, N. Y.

566. Arc Welding Manual, S, PS, James F. Lincoln Arc Welding Foundation, Cleveland, O.

567. A Stitch in Time, S, PS, James G. Biddle Company, Plymouth Meeting, Pa.

568. American Electricians Handbook, S, PS, McGraw-Hill Book Company, Inc., New York, N. Y.

569. Fundamentals of Electricity, S, American Technical Society, Chicago, Ill.

575. Electricity in the Home and on the Farm, S, PS, John Wiley and Sons, Inc., New York, N. Y.

576. Rural Electrification, S, PS, The Bruce Publishing Company, Milwaukee, Wis.

577. Farm Electrification Reference, Smith, Pennsylvania Electric Company, Johnstown, Pa.

578. Primer of Lamps and Lighting, S, PS, Sylvania Electric Products, Inc., New York, N. Y.

579. Competitive Reference Manual, S, PS, Southeastern Electric Exchange, Atlanta, Ga.

580. National Fire Protection Association Handbook of the National Electrical Code, S, PS, McGraw-Hill Book Company, New York.

582. Wiring Simplified, S, PS, Park Publishing, Inc., Minneapolis, Minn.

583. Wiring Manual for Farm and Home, PS, McGraw-Hill Book Company, New York, N. Y.

588. Residential Wiring Handbook, PS, Industry Committee on Interior Wiring Design, New York, N. Y.

589. Lighting Handbook, fourth edition, S, PS, Illuminating Engineering Society, New York, N. Y.

590. Lighting Education, laboratory experiments, S, PS, McGraw-Hill Book Company, New York, N. Y.

591. Electricians' Practical Library, five volumes, S, PS, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Bulletins and Circulars

604. Lighting for Better Living, P, S, Better Light Better Sight Bureau, New York, N. Y.

605. Working with Light, P, S, Better Light Better Sight Bureau, New York, N. Y.

606. Farm Electric Motors, S, PS, Book Department, Electricity on the Farm, New York, N. Y.

607. Single-Phase Electric Motors for Farm Use, S, PS, U. S. Department of Agriculture, Washington, D. C.

608. Electrodes for Farm Arc Welding, S, PS, North Dakota State University, Fargo, N. D.

609. Teachers Guidebook for Living with Light, P, Better Light Better Sight Bureau, New York, N. Y.

610. Educational Media Index, McGraw-Hill Book Company, New York.

611. Electrical Safety Leaflets, P, S, The Connecticut Light and Power Company, Hartford, Conn.

612. Electric Farm Power Quarterly, S, PS, North Dakota Power Use Council, Fargo, N. D.

613. Safety Grounding, leaflet, S, PS, Alabama Power Company, Birmingham, Ala.

Educational level code:

P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

## Technical Electrification Teaching Materials

101. *APPLIED ELECTRICITY, for Industrial Arts, S, PS, 8 1/2 x 11 spiral bound, 159 pp., 1963, $2.04, Department of Industrial Education, College of Education, University of Missouri, Columbia, Mo. 65201.

This course of study presents experiments and activities presenting principles and their application as a most effective method of instruction. It includes references, job sheets, teaching plans, evaluation of materials, instructional aids, shop equipment, and supplies.

102. *MOTORS, APPLICATION, AND CONTROL, PS, 8 1/2 x 11 three ring binder, 92 pp., 9 commercial bulletins, inquire about availability, Indiana and Michigan Electric Company, 2101 Spy Run Avenue, Fort Wayne, Ind. 46800.

A special short course on industrial motors and their associated control systems designed for teaching utility people, plant electricians, and electrical contractors. It does not specifically cover farm applications but is quite complete on motors. It is condensed into six 2-hour lessons. It would be of value to any motor installer or maintenance man.

103. *FUNDAMENTALS OF ELECTRICITY, File No. 723, Elwood Thames, S, PS, 8 1/2 x 11, 28 pp., 1949, Department of Trade and Industrial Education, University of Alabama, University, Ala. 35486.

This electrical study guide, as used in Alabama, should be completed before the learner starts work in other electrical study guides. See Item No. 104. The twelve areas in this guide are divided into fourteen jobs. Job, progress, and information sheets are provided along with required reading references. There are three supplements available: 723A Answers to Questions, 723E Examination Questions, 723EA Answers to Examination Questions.

104. *INDUSTRIAL ELECTRICITY, William H. Bothman, Elwood Thames, Converse Harwell, and Consultant, L. M. Fisher, Jr., S, PS, 8 1/2 x 11, 155 pp., 1959, Department of Trade and Industrial Education, University of Alabama, University, Ala. 35486.

This study guide and record of progress in industrial electricity is for individual use in a cooperative training program, and includes essential information not available elsewhere and necessary references. The twelve areas are divided into 99 jobs and special progress record sheets for each are included.

105. *CURRICULUM MATERIALS, for Trade and Industrial Education, OE-84023-A, by Office of Education, U. S. Department of Health, Education, and Welfare, S, PS, 5 x 9, 88 pp., 1963, $0.35, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

This catalogue gives nine pages of listed training materials for electric linemen, electrical appliance repair, electrical trades, and electronics.

Cross Reference Items -- See these Numbers

under VOCATIONAL AGRICULTURE: Technical

1. Farm Electrification Handbook, S, PS, State Department of Education, Baton Rouge, La.

2. Farm Electricity, S, PS, State Department of Education, Baton Rouge, La.

3. Guide for Teaching Practical Electricity, S, PS, Ohio Edison Company, Akron, O.

4. Adequate Wiring, S, PS, State Department of Education, Little Rock, Ark.

5. Teaching Electricity in Vocational Agriculture, P, S, PS, Department of Agricultural Education, University of Missouri, Columbia, Mo.

6. Selection, Operation, and Maintenance of Electric Motors, S, PS, Agricultural Education Department, Pennsylvania State University, University Park, Pa.

7. Electric Motors for the Farm, S, PS, Edison Electric Institute, New York, N. Y.

9. Lessons in Farm Electrification, S, PS, Pennsylvania State University, University Park, Pa.

11. Farm Electrification Study Manual for Vocational Agricultural Students, S, PS, State Department of Vocational Education, Phoenix, Ariz.

12. Farm Electrification Teaching Manual for Vocational Agricultural Instructors, S, PS, State Department of Vocational Education, Phoenix, Ariz.

16. Electric Motors for Farm Use, S, PS, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

17. Electrical Controls Kit Materials, S, PS, Vocational Agriculture Service, University of Illinois, Urbana, Ill.
    1. Applying Electrical Controls in Farm Production
    2. Suggestions to the Teacher
    3. Exercises for Use with Electrical Controls Kit
    4. Slide Film, Unpacking, Checking Controls

20. Farm Electrification for Vocational Agriculture, P, S, 3 items, New Jersey Department of Education, Trenton, N. J.

21. Suggestions for Teaching Farm Electrification, S, PS, Edison Electric Institute, New York, N. Y.

22. Electrical Wiring--Fundamentals and Planning, S, PS, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

23. Electrical Wiring --Procedures and Exercises, S, PS, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

24. Electrical Hazards on the Farm, P, S, PS, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

27. Farm Electrification, P, S, Central Power and Light Company, Corpus Christi, Texas.

29. Electrical Controls on the Farm, S, Alabama Power Company, Birmingham, Ala.

Educational level code:

P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

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* Indicates items that are in the FEC Library and which may either be reviewed there or borrowed free by FEC members.

## Vocational-Technical and Trade and Industry Electrical Program

### Electrical Course Outlines and Guides

151. *ELECTRICAL TRADES, for Vocational High Schools, Bureau of Trade and Technical Education, S, PS, 8 1/2 x 11 spiral bound, 102 pp., 1958, The University of the State of New York, State Education Department, Albany, N.Y. 12200.

This electrical trades syllabus brings into curriculum development "know how" and "experience". It gives content and scope, plus ideas for more effective teaching. It includes references for visual aids and texts. It lists suggested tools, instruments, and equipment.

152. *ELECTRONIC TECHNOLOGY, Course Outline, S, PS, 8 1/2 x 11 spiral bound, 50 pp., 1966, West Virginia State Board of Education, Bureau of Vocational, Technical, and Adult Education, State Capitol, Charleston, W. Va. 25300.

The syllabus gives proposed courses of study of three years and two years. Enrolling students will be in the ninth or tenth grade. The electronic program covers DC, AC, basic electronics, communications, AM radio, FM radio, transistors, pulse circuit fundamentals, and television. The program for the post-secondary level covers microwave components and systems, equipment lists, and instruction aids.

153. *INDUSTRIAL ELECTRICITY, Course Outline, P, S, PS, 8 1/2 x 11 spiral bound, 40 pp., 1965, West Virginia State Board of Education, Bureau of Vocational, Technical and Adult Education, State Capitol, Charleston, W. Va. 25300.

This is a syllabus, not a course of study. The courses outlined are designed to start with persons 15 years old or older. Objectives are to acquaint students with vocational opportunities, care and use of instruments and tools, applied technical information of the trade, and specific skills. Offerings include fundamentals, joints, circuits, equipment, wiring, repairing, and winding motors. An equipment list and text bibliography are included.

154. *VOCATIONAL TECHNICAL TRAINING, S, PS, 6 x 9, 40 pp., 1966, Kansas State College, Pittsburg, Kan. 66762.

The information bulletin of Kansas State College shows courses available in the department of vocational training. It includes one on air conditioning and refrigeration, taking two years, and one on electricity, also a two-year course. Inquire for information and outlines of special short courses.

155. *BASIC ELECTRICITY AND ELECTRICAL APPLICATION COURSES, P, S, PS, 8 1/2 x 11 mimeograph, 23 pp., 1966, Indiana Vocational College, Weir Cook Division, 6800 West Raymond Street, Indianapolis, Ind.

(More on this item on next page)

The courses outlined were cooperatively developed with the Indiana Farm Electrification Council, Inc. The outlines are for a series of 6 courses: basic electricity--general, household appliance--electrical installation, refrigeration helper, refrigeration and air conditioning installation, appliance service--upgrading skills, small household appliance repair. They are evening courses, each running from 18 to 36 weeks.

156. *BULLETIN OF NORTH GEORGIA TECHNICAL AND VOCATIONAL SCHOOL, S, PS, 6 x 9, 64 pp., 1966, North Georgia Technical and Vocational School, Clarksville, Ga. 30523.

This catalogue outlines the Electrician's Course and the Electrical Servicing Course, sponsored by the Georgia Power Company. Workbooks and manuals cost approximately $10.00 for the appliance course and $5.00 for the electrician's course. An entrance test is required.

157. *COURSE OUTLINE IN ELECTRICITY FOR SOUTH CAROLINA AREA TRADE SCHOOLS, S, PS, 8 1/2 x 11, 30 pp., 1966, information by special request, contact State Supervisor, Trade and Industrial Education, State Department of Education, Columbia, S. C. 29201.

The assemblage of information includes material covered, requirements, outlines, and necessary references for the accelerated course in electrical fundamentals, the standard course in electrical fundamentals, and the code certification course.

158. *APPRENTICE INSIDE WIREMAN, Instruction Outline, S, PS, 8 1/2 x 11 mimeograph, 15 pp., 1966, Wisconsin Board of Vocational, Technical, and Adult Education, Room 720, 1 West Wilson Street, Madison, Wis. 53702.

This outline was designed for the instruction of apprentices. It also lists references.

159. *APPRENTICE POWER LINEMAN, Instruction Outline, S, PS, 8 1/2 x 11 mimeograph, 4 pp., 1966, Wisconsin Board of Vocational, Technical, and Adult Education, Room 720, 1 West Wilson Street, Madison, Wis. 53702.

This outline was designed for the instruction of apprentices. It also lists references.

160. *ELECTRONIC TECHNOLOGY, Suggested Two Year Curriculum, PS, 8 1/2 x 11 paperback, 67 pp., 1966, Illinois Board of Vocational Education, 405 Centennial Building, Springfield, Ill. 62706, or College of Engineering, University of Illinois, Urbana, Ill. 61801.

This suggested two-year post-high school program was developed by the Engineering Technology Curriculum Advisory Committee of the College of Engineering, University of Illinois. The proposal is in complete detail and includes the mathematics, physics, and orientation courses necessary to provide a high level of understanding of the technical as well as of the industry.

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* Indicates items that are in FEC Library

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161. *CATALOG OF ELECTRICAL COURSES, Connecticut State Technical Institute, PS, 6 x 9, 1966, Connecticut State Department of Education, Bureau of Technical Institutes, Box 2219, Hartford, Conn. 06115.

There are four state technical schools, Norwich, Hartford, Waterbury, and Norwalk, in Connecticut. Both day and night programs are given to prepare qualified engineering technicians for immediate employment. Electrical and data processing courses are given. Candidates must be high school or vocational-technical school graduates or have a State high school equivalency certificate.

162. *ELECTRICAL AND ELECTRONIC TECHNOLOGIES, Job Descriptions and Suggested Techniques for Determining Courses of Study, by Office of Education, U. S. Department of Health, Education, and Welfare, S, PS, 8 1/2 x 11 printed, 34 pp., 1966, $0.30, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

This booklet details the fields of work, job relationships, job descriptions, and training requirements, and gives suggestions on developing a curriculum.

163. *ELECTRICAL TECHNOLOGY, A Suggested 2-Year Post High School Curriculum, Office of Education, U. S. Department of Health, Education, and Welfare, P, PS, 8 1/2 x 11 printed, 118 pp., 1960, $0.75, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

These suggested course outlines have to be arranged to provide the optimum specialized technical instruction desired in a 2-year post high school program. The objective is an understanding of the engineering principles basic to the field of electrical power technology.

164. *INSTRUMENTATION TECHNOLOGY, A Suggested 2-Year Post High School Curriculum, by Office of Education, U. S. Department of Health, Education, and Welfare, PS, 8 1/2 x 11 printed, 120 pp., 1966, $0.75, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

The courses outlined in the plan of study are designed and organized to provide a knowledge of the physical sciences and of control devices. They help develop the technical skills involved in their application to instrument control of processes, systems, and operations in modern industry.

165. LIGHTING FUNDAMENTALS COURSE, ED-2, S, PS, 1961, 108 pp., $3.00, Illuminating Engineering Society, Publications Sales Office, 345 East 47th Street, New York, N. Y. 10017.

The text covers basic lighting education in twelve outlined lessons, including physics of light and vision, light sources, illumination design and lighting application problems for six different areas. Students learn how to make actual layouts, measurements, and analysis.

166. *COURSE OF STUDY OUTLINE, Industrial Electricity, William L. Springer, S, 8 1/2 x 11 spiral bound, 40 pp., 1965, Sussex County Vocational-Technical Center, Highway 28, Georgetown, Del. 19947.

This industrial electricity course is intended for male high school students interested in securing employment in the electrical field. It is in-the-main a shop course covering house wiring, motor winding, motor control, electrical generators, and industrial wiring.

167. ELECTRICITY AND ELECTRONICS for General Electric Major Appliance Technicians, S, PS, 8 1/2 x 11, Course I, No. 30-2400, 14 workbooks; Course II, No. 30-2600, 10 workbooks; Course III, No. 30-2800, 11 workbooks and kit with solid state components. For price and availability, contact your nearest General Electric Major Appliance Distribution House.

| | Pages |
|---|---|
| *Course I, 30-2400 | |
| Course I Reference Book | 38 |
| Book One - Resistors, Lamps, Heaters | 32 |
| Book Two - Switches and Contacts | 34 |
| Book Three - Reactors, Solenoids, Relays | 40 |
| Book Four - Transformers | 52 |
| Book Five - Fluorescent Lamps and Ballasts | 38 |
| Book Six - Single-Winding Motors | 42 |
| Book Seven - Two-Winding Motors | 50 |
| Book Eight - Capacitors & Capacitor Start Motors | 36 |
| Book Nine - Multiple-Winding Motors | 32 |
| Book Ten - Thermal Protectors | 22 |
| Book Eleven - Wiring Outside the Appliance | 22 |
| Book Twelve - Measurement for Circuit Faults | 34 |
| Book Thirteen - Mathematics | 42 |
| *Course II, 30-2600 | |
| Book One - Series and Parallel Circuits | 44 |
| Book Two - Meters and Measurements | 46 |
| Book Three - Power, Heat and Watts | 38 |
| Book Four - AC Electricity | 36 |
| Book Five - Current in Coils | 44 |
| Book Six - Phase Relationships | 38 |
| Book Seven - Capacitors | 62 |
| Book Eight - Phase Relationships in Capacitors | 48 |
| Book Nine - Diode Rectifiers | 34 |
| Book Ten - Rectifier & Capacitor Applications | 60 |
| Course III, 30-2800, includes solid state component kit | |
| Book One - Course II Review | |
| Book Two - Introduction to Semiconductor Diodes | |
| Book Three - Care and Handling of Semiconductors | |
| Book Four - Switching Devices and Neon Lamps | |
| Book Five - Sensors for Heat, Light & Humidity | |
| Book Six - Controlled Rectifiers: DC Conditions | |
| Book Seven - Silicon Controlled Rectifiers: AC Conditions | |
| Book Eight - Full-Wave Control with an SCR | |
| Book Nine - Control Devices | |
| Book Ten - The Unijunction Transistor | |
| Book Eleven - Simple Transistors and Applications | |

(More on this item on next page)

This self-study course is designed to help the person learn about electricity and what electricity does in complex circuits. Learning problems are related to the appliances and components that are in everyday use. Questions and answers, written and diagramed, help the learner check progress and move along at a reasonable pace.

Courses II and III are designed to strengthen the learner's electrical background and introduce new information needed to service appliances of today and tomorrow. With good basic knowledge, the technician can be more flexible and creative in solving new problems on more complicated appliances.

Cross Reference Items -- See these Numbers

under VOCATIONAL AGRICULTURE: Electrification Course Outlines

73. Basic Electricity, S, PS, U. S. Department of Agriculture, Washington, D. C.

74. Basic Electronics, S, PS, U. S. Department of Agriculture, Washington, D. C.

76. Electrical Tips for Everyone, S, PS, Department of Agricultural Education, Pennsylvania State University, University Park, Pa.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Demonstration Boards and Work Kits

301. Farm Electrification Teaching Aids, S, PS, Dayton Power and Light Company, Dayton, O.

302. Suggestions for Teaching Farm Electrification, S, PS, Carolina Power and Light Company, Raleigh, N. C.

303. Farm Wiring Demonstrations, S, PS, University of Missouri, Columbia, Mo.

304. Demonstration Manual, Electrical Distribution and Use, S, PS, Ohio Farm and Home Electrification Council, Columbus, O.

305. An Electric Work Center for the Vocational Agriculture Shop, S, PS, The Pennsylvania State University, University Park, Pa.

306. Demonstrations in Farm and Home Lighting, P, S, Michigan State University, East Lansing, Mich.

307. Lighting Demonstrations, P, S, Kansas Inter-Industry Farm Electric Utilization Council, Manhattan, Kan.

308. Demonstration Manual, S, PS, same as Item No. 304 except includes construction plans and materials list, Ohio State University, Columbus, O.

309. Electric Demonstration Center, S, PS, Vermont Department of Education, Montpelier, Vt.

310. Demonstration Manual, Fundamentals of Farm Wiring, S, PS, Kansas State University, Manhattan, Kan.

313. Operating the Carbon Arc Torch, S, PS, Cornell University, Ithaca, N. Y.

315. Electric Demonstration Kit, S, PS, Electro-Tech, Inc., Hapeville, Ga.

316. Project Materials, P, S, Edison Electric Institute, New York, N.Y.

317. Catalogue, P, S, Edmund Scientific Company, Barrington, N. J.

319. Voltage-Tester-110-220, S, Agricultural Extension Service, Berkeley, Calif.

321. Electrical Projects, P, S, Lyon Rural Electric Company, Berkeley, Calif.

323. Working with Light, S, Better Light Better Sight Bureau, New York, N. Y.

328. Experimenting with Electricity, P, S, Alabama Power Company, Birmingham, Ala.

330. Educational Aids for Youth, P, S, PS, Agricultural Engineering Department, University of Massachusetts, Amherst, Mass.

331. Projection Meters, for use with overhead projector, Central Scientific Company, Mountainside, N. J.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Charts

351. Generation, Transmission, and Distribution of Electricity, P, S, Alabama Power Company, Birmingham, Ala.

352. Lead Type Storage Battery, parts and operation, P, S, PS, Electric Storage Battery Company, Philadelphia, Pa.

Educational level code:

P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Movie Films

361. Adequate Wiring, S, PS, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

362. Automatic Controls, S, PS, 14 1/2 minutes, B/W, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich.

367. The Wonder-Filled Age of Electricity, P, S, PS, 20 minutes, color, National Electrical Manufacturers Association, New York

368. Electricity at Work, S, PS, color, sound, 15 minutes each, Dept. of Agricultural Engineering, Michigan State University, East Lansing, Mich.
   1. Putting Electrons to Work
   2. Understanding Volts, Amperes, and Ohms
   3. Using Ohm's Law to Understand Circuits
   4. Watts, Watthours, Watthour Meters
   5. Mechanical Generation of Electricity
   6. How Transformers Work
   7. The 120/240 Volt 3-Wire System
   8. Understanding Branch Circuits
   9. Understanding Common Induction Motors
   10. Starting Characteristics of Common Induction Motors

371. Principles of Electricity, S, PS, [illegible] minutes, General Electric Educational Films, New York, N. [illegible].

372. A Is for ATOM, S, PS, 15 1/2 minutes, General Electric Educational Films, New York, N. Y.

373. Electrical Safety in the Home, P, S, PS, color, Stout State University, Menomonie, Wis.

374. My Pop's A Lineman, P, S, PS, color, Stout State University, Menomonie, Wis.

379. Electricity and Magnetism, five films, S, B/W, Encyclopaedia Britannica Educational Corporation, Chicago, Ill.

380. Electricity--Distribution, S, PS, color, Indiana University, Bloomington, Ind.

381. Electricity--Measurement, S, PS, color, B/W, Indiana University, Bloomington, Ind.

382. Electricity--Static Electricity, P, PS, color, B/W, Indiana University, Bloomington, Ind.

383. Electricity--Production, S, PS, color, B/W, Indiana University, Bloomington, Ind.

384. Electricity--From Power Plant to Home, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

385. Electromagnets, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

386. The Flow of Electricity, P, S, color, B/W, McGraw-Hill Book Company, New York, N. Y.

<u>Cross Reference Items</u> -- See these Numbers

under VISUAL AIDS: Filmstrips

401. Farm Electric Motors, Selection, Protection, and Drives, S, PS, 68 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

402. How Farm Electric Motors Start and Run, S, PS, 86 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

403. Electrical Terms--Their Meaning and Use, P, S, 89 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

404. Understanding Electricity, P, S, Society for Visual Education, Chicago, Ill.
- 412-1 How Radio and Radar Work, 59 frames, 14 minutes.
- 412-2 How Electricity Is Produced, 61 frames, 14 minutes.
- 412-3 Producing Static Electricity, 59 frames, 13 minutes.
- 412-4 Electric Circuits and How They Work, 58 frames, 6 to 12 1/2 minutes.

405. Electric Circuits, P, S, 57 frames, Society for Visual Education, Chicago, Ill.

406. The Principles of Electric Motors and Generators, P, S, 68 frames, Society for Visual Education, Chicago, Ill.

407. Learning Arc Welding Skills, S, PS, set of three, James F. Lincoln Arc Welding Foundation, Cleveland, O.

408. Diagramming Electrical Wiring Circuits, S, PS, six filmstrips, University of Illinois, Urbana, Ill.

411. DC and AC Motor Theory, Testing, Connecting and Trouble Shooting, S, PS, four filmstrips, B/W, University of Illinois, Urbana, Ill.

412. Basic Electricity, P, S, twelve filmstrips, B/W, The Jam Handy Organization, Detroit, Mich.

<u>Educational level code</u>:

P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Slides, Overhead Projector Transparencies

451. The Electrification Farm Story, S, PS, Edison Electric Institute, New York, N. Y.

452. Fundamentals of Electricity, S, PS, Michigan State University, East Lansing, Mich. Items used as teaching aids:
1. Putting Electrons to Work
2. Mechanical Generation of Electric Power
3. How A Transformer Works
4. Common Induction Motors, Types and Their Differences

456. Electricity Series, transparencies for the overhead projector, S, PS, eleven units, Keuffel & Esser Company, local branches or Hoboken, N. J.

457. How Electricity Performs, S, PS, electrical understanding, 6 sets, Michigan State University, East Lansing, Mich.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Textbooks and Booklets

501. Electrical Terms, Their Meaning and Use, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

502. Fundamentals of Electricity and Magnetism, P, S, PS, Delco-Remy Division, General Motors, Anderson, Ind.

503. Living with Electricity, P, S, PS, Dayton Power and Light Company, Dayton, O.

504. Aids to Using Electricity on Indiana Farms, S, PS, Purdue University, Lafayette, Ind.

505. Basic Electricity and an Introduction to Electronics, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

506. ABC's of Electricity, P, S, Howard W. Sams and Company, Inc., Indianapolis, Ind.

507. Practical Science Projects in Electricity/Electronics, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

508. Interior Electric Wiring, Residential, S, PS, American Technical Society, Chicago, Ill.

509. Interior Electric Wiring, Residential, Study Guide, S, PS, American Technical Society, Chicago, Ill.

510. Electrician's Examinations, Questions and Answers, PS, Theodore Audel and Company, Indianapolis, Ind.

511. Electric Science Dictionary, S, PS, Theodore Audel and Company, Indianapolis, Ind.

512. Electrical Power Calculations, S, PS, Theodore Audel and Company, Indianapolis, Ind.

513. Programmed Basic Electricity Course, P, S, PS, Theodore Audel and Company, Indianapolis, Ind.

514. Instructional Materials for Trade, Industrial, and Technical Occupations, S, PS, Instructional Materials Laboratory, Columbus, O.

515. Selected References and Aids Useful in Teaching Agricultural Mechanics, Agricultural Education, N. Y. State College of Agriculture, Ithaca, N. Y.

516. Farm Electrification, Brown, S, PS, McGraw-Hill Book Company, New York, N. Y.

517. ABC's of Electric Motors and Generators, S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

518. Learning Electricity Fundamentals, (P limited), S, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

521. Practical Electric Wiring, Richter, S, PS, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Handbooks, Manuals, and Guides

553. Farmstead Wiring Handbook, S, PS, Farm Electrification Council, Oakbrook, Ill.

554. Simplified Electric Wiring Handbook, S, PS, Sears, Roebuck and Company, local.

555. Wiring Diagrams for Light and Power, PS, Theodore Audel and Company, Indianapolis, Ind.

556. Maintaining the Home Lighting and Wiring System, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

557. Farm Electric Motors, Selection, Protection, Drives, S, PS, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

558. Introduction to Electric Motors, S, PS, Potomac Edison Company, Hagerstown, Md.

559. Care of Electric Motors, A Guide, S, PS, Allis-Chalmers Company, Milwaukee, Wis.

560. Protection Handbook, Based on 1962 Code, S, PS, Bussmann Manufacturing Division of McGraw Edison Company, St. Louis, Mo.

561. Electrical Machinery Catechism, PS, Fairbanks-Morse Company, Freeport, Ill.

562. Electrical and Basic Controls Used in Agriculture, Teaching Suggestions, S, PS, Edison Electric Institute, New York, N. Y.

563. Modern Electric Controls, Application Manual, PS, Furnas Electric Company, Batavia, Ill.

564. Electrical Motor Controls and Circuits, PS, Howard W. Sams and Company, Inc., Indianapolis, Ind.

565. Camp Counselors Manual for Teaching, P, S, The Connecticut Light and Power Company, Hartford, Conn.

566. Arc Welding Manual, S, PS, James F. Lincoln Arc Welding Foundation, Cleveland, O.

567. A Stitch in Time, S, PS, James G. Biddle Company, Plymouth Meeting, Pa.

568. American Electricians Handbook, S, PS, McGraw-Hill Book Company, New York, N. Y.

569. Fundamentals of Electricity, S, American Technical Society, Chicago, Ill.

570. National Electrical Code and Blueprint Reading, S, PS, American Technical Society, Chicago, Ill.

578. Primer of Lamps and Lighting, S, PS, Sylvania Electric Products, Inc., New York, N. Y.

580. National Fire Protection Association Handbook of the National Electrical Code, S, PS, McGraw-Hill Book Company, New York.

581. National Electrical Code, PS, National Board of Fire Underwriters, Chicago, Ill.

582. Wiring Simplified, S, PS, Park Publishing, Inc., Minneapolis, Minn.

583. Wiring Manual for Farm and Home, PS, McGraw-Hill Book Company, New York, N. Y.

584. Electrical Estimating, PS, McGraw-Hill Book Company, New York.

585. Remote Control Wiring, S, PS, General Electric Company, Providence, R. I.

586. Electrical Equipment Manual, PS, McGraw-Hill Book Company, New York, N. Y.

587. Lighting Handbook for Industrial Arts Classes, S, PS, Better Light Better Sight Bureau, New York, N. Y.

588. Residential Wiring Handbook, PS, Industry Committee on Interior Wiring Design, New York, N. Y.

589. Lighting Handbook, fourth edition, S, PS, Illuminating Engineering Society, New York, N. Y.

590. Lighting Education, laboratory experiments, S, PS, Illuminating Engineering Society, New York, N. Y.

591. Electricians' Practical Library, five volumes, S, PS, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Bulletins and Circulars

605. Working with Light, P, S, Better Light Better Sight Bureau, New York, N. Y.

608. Electrodes for Farm Arc Welding, S, PS, North Dakota State University, Fargo, N. D.

610. Educational Media Index, McGraw-Hill Book Company, New York.

613. Safety Grounding, leaflet, S, PS, Alabama Power Company, Birmingham, Ala.

## 4-H Club Electric Project Program Materials

(This section only: Educational level evaluation is in terms of B, for Basic; I, for Intermediate; and S, for Senior. Also, all materials 8 1/2 x 11", unless indicated otherwise.)

201. *ALABAMA, Auburn University, Auburn, 36830.

Handbook: Set of 4-H Club Electric Project Guide Sheets, B,I,S.
ABC's of Good Lighting, B, I.
Fundamentals of Good Lamp Building, B, I.
The House Electricity Built, I, S.
Lamp Assembly Instruction, B, I
The Alabama Study Lamp Program, B,I, S.
Leaders Idea Book, Westinghouse Electric Corporation
Members Idea Book, Westinghouse Electric Corporation

Experimenting with Electricity, B, I, Alabama Power Company, see item No. 328.

Project Materials, for youth groups, B, I, S, Edison Electric Institute, see item No. 316.

202. *ALASKA, University of Alaska, College, 99701.

1st Year Electrical Project, B, 7 Guide Sheet units, 24 pp.

4-H Electric Project Leader's Guide, 1st Year, B, 8 pp.

Electric Project No. 2, B, I, 7 Guide Sheet units, 24 pp.

Electric Project No. 2, Leader's Guide, 8 pp.

203. *ARIZONA, University of Arizona, Tucson, 85721.

Handbook: Electric Project Leaders Guide, requirements, helps, 16 pp.
Catalog List, kits and materials
Reference List, experiments, games, puzzles, information
Guide Sheet List and copies, B, I, S.

204. *ARKANSAS, Agricultural Extension Service, Box 391, Little Rock, 72203.

Electric Workbook, B, I, 24 pp.

Senior Handbook, boys, includes 2 pp. of Electricity; also a Record Book, S.

Senior Handbook, girls, includes 2 pp. of Electricity; also a Record Book, S.

205. *CALIFORNIA, Agricultural Extension Service, University of California, Davis, 95616.

4-H Electric Project Outline, B, I, S, 8 pp.

(More on this state's material on next page)

Electric Project Leaders Guide, B, I, S, 12 pp.

Electric Project Manual, Horsepower, B, 48 pp.

Electric Project Manual, Housepower, B, 44 pp.

Electric Project Manual, Live Better Electrically, I, 56 pp.

Electric Project Manual, Farm Better Electrically, I, 68 pp.

Electric Project Manual, Advanced, S, 4 page fold.

4-H Club Record, Electric, B, I, S, 4 page fold.

Portable P. A. System, S, 28 pp.

206. *COLORADO, Colorado State University, Fort Collins, 80521

Unit 1, 4-H Electric Project, 16 Guide Sheets, B, 60 pp.

Unit 2, 4-H Electric Project, 15 Guide Sheets, I, 52 pp.

Unit 3, 4-H Electric Project, 13 Guide Sheets, S, 52 pp.

Leader's Guide, B, I, S, 28 pp.

Tool Holder for Girls, B, single sheet.

Films for 4-H Electric, list, 2 pp.

207. *CONNECTICUT, University of Connecticut, Storrs, 06268

Handbook of Electric Project Guide Sheets, with suggestions, B, I, S.

Record, 4-H Electric Project, B, single sheet.

Record, 4-H Electric Project, I, S, single sheet.

Electric Motors, Leaders Guide, instruction, information, Guide Sheets, B, I, S, approximately 40 pp.

Fundamentals of Electricity Demonstrations, diagrams, instructions, information, B, I, S, 44 pp.

208. *DELAWARE, University of Delaware, Newark, 19711

Introduction to Electricity, Unit 1, B, 11 Guide Sheets, 52 pp.

Exploring Electricity, Unit 2, I, 10 Guide Sheets, 52 pp.

Suggestions for Third Year Work, S, 4 pp. mimeo.

209. *FLORIDA, University of Florida, Gainesville, 32603

Leaders Guide, 4-H Electric Program, what to do, contests, awards, visual aids, 12 pp.

(More on this state's material on next page)

Program Plans for Leaders, covers programming for eight subjects, B, I, S, 8 pp.

Electric Workbook, Units 1 and 2, B, 5 activities, 16 pp.

Electric Workbook, Unit 3, I, S, 10 activites, 12 pp.

4-H Electric Project Guide Sheet Set, 17 units, 64 pp.

4-H Club Electricity Record Book, B, I, S, 8 pp.

Electricity Made Easy, B, I, 20 problems and answers, ranging from repairing cords to meanings of electrical terms and planning wiring, 6 x 9", 16 pp.

Electric Demonstrations Made Easy, B, I, S, script for 2 person teams ranging from tying the electrician's knot to dramatizing voltage drop, 6 x 9", 20 pp.

210. *GEORGIA, University of Georgia, Athens, 30601

4-H Cloverleaf, Engineering Electric, B, 7 lesson units, 24 pp.

4-H Junior, Engineering Electric, I, 7 lesson units, 24 pp.

4-H Electric Project for Senior Boys and Girls, S, 4 x 9, 3 pp. fold.

4-H Engineering--Electronics, I, S, 6 Guide Sheet units, 32 pp.

Electrical Terms, Their Meaning and Use, American Association for Agricultural Engineering and Vocational Agriculture, See Item No. 501.

211. *HAWAII, University of Hawaii, Honolulu, 96822

4-H Electric Project, Housepower, B, 44 pp., see California

4-H Electric Project, 2nd Year, I, 44 pp. mimeo, see California

4-H Electric Project, 3rd Year, S, 48 pp., see California

Wash Your Duds Party, 4-H Electric Activity, I, S, 12 pp.

Record Book, 4-H Electric Project, B, I, S, 12 pp.

212. *IDAHO, University of Idaho, Moscow, 83843

Electricity for the 4-H Scientist:

Division 1, B, 15 Guide Sheet units, 62 pp.

Division 2, I, 14 Guide Sheet units, 52 pp.

Division 3, I, 13 Guide Sheet units, 52 pp.

Division 4, S, 12 Guide Sheet units, 52 pp.

Division 6, welding, S, 5 Guide Sheet units, 24 pp.

212. *IDAHO (continued)

Electrical Science, Leader's Guide and Script, Unit 1, B, 6 vols., approx. 80 pp. The information and instructions cover a special series of meetings for developing basic understandings:

The Atom and Static Electricity, Unit 1, Part A, 1st, 2nd, and 3rd meetings.
Natural and Artificial Magnets, Unit 1, Part B, 1st, 2nd, and 3rd meetings.

213. *ILLINOIS, University of Illinois, Urbana, 61801

Electricity Manual and Record Book, 1st Year, B, 12 Guide Sheet units with work sheets and quiz sheets, 52 pp.

Electricity Manual, 2nd Year, I, Guide Sheets and special information sheets, 38 pp.

Electricity Manual, Advanced, S, Guide Sheets and specially prepared material, 52 pp.

Electricity Manual, Supplement--Advanced, S, 12 Guide Sheet sets including welding and electronics, 48 pp.

Illinois 4-H Record, Electricity: 1st Year, B, 12 pp.
2nd Year, I, 4 pp.

4-H Electric Check Lists (cords, lamps, posters, valance lighting, equipment) B, I, S, 4 x 6" cards, printed.

Electric Control Exercises for 4-H'ers, by Illinois Farm Electrification Council, S, 12 pp.

Illinois 4-H Electric Activities, I, S, usually one activity each year:

Learn About Small Appliances, 8 pp.
Let's Look at Lamps, 4 pp.
Electric Activity Report Form, single sheet

Meeting Plans, 4-H Electric, Conducted by Power Supplier Representatives, B, I, S, complete information and meeting suggestions, first year and second year--three meetings each. Covers lighting, motors, protection, loading, reversing, switches, controls, timers, wires, testers, 86 pp. Available from Illinois Farm Electrification Council.

214. *INDIANA, Purdue University, Lafayette, 47907

Indiana 4-H Electric Project, much original material, mimeo.:
Division 1, B, I, 22 pp.

Division 2, I, 20 pp.

Division 3, I, S, 22 pp.

Division 4, S, 20 pp.

Division 5, S, 18 pp.

215. *IOWA, Iowa State University, Ames, 50010

Iowa 4-H Electric Project Leader's Manual, a comprehensive arrangement of all B, I, S material, including what is club work, the Leader's role, tools needed, programming, how to handle meetings, projects and activities, events, demonstrations, Guide Sheets and supplemental materials, approx. 350 pp. Separate Leader's Guides are available.

Unit 1, Understanding Electricity, B, 8 pp.
Unit 2, Wiring and Circuit Planning, B, I, S, 20 pp.
Unit 3, Electric Motors, B, I, S, 16 pp.
Unit 4, Heat, Ventilation, and Refrigeration, I, S, 16 pp.
Unit 5, Lighting, B, I, S, 6 pp.
Unit 6, Electronics, I, S, 8 pp.
Electric Activity Manual, four lessons, B, I, S, 48 pp.

216. *KANSAS, Kansas State University, Manhattan, 66504

4-H Electric Project, Leaders Guide, comprehensive treatment of the program, 16 pp. printed.

Workbooks with Guide Sheets, each division in three sections:
Experimenting with Electricity, B, Section 1, 28 pp.; 2, 28 pp.; 3, 24 pp.; one sheet Project Record Form; Leader's Guide, 14 pp.

Learning with Electricity, I, Section 1, 32 pp.; 2, 28 pp.; 3, 28 pp.; one sheet Record for Intermediate; Leader's Guide, 16 pp.

Growing with Electricity, S, Section 1, 32 pp.; 2, 32 pp.; 3, 32 pp.; Advanced Record, 4 pp.; Leader's Guide, 18 pp.

Supplemental Material:
Advanced Phase--Electronics, 5 Guide Sheets
Guide Sheet Set
Judging Suggestions
Companies Handling Materials, list
16 mm Motion Picture Films, list
Special Sheets: study center, photo cell control, bell alarm for wet basement, power failure alarm, code practice oscillator-amplifier, electronic blinker, and electrical outlet symbols.

217. *KENTUCKY, University of Kentucky, Lexington, 40506

Leader's Guide for the 4-H Electrical Projects, much original work has gone into the preparation of the material, 12 pp.

4-H Electric Project:
First Year and Record, B, 5 units, 40 pp.
Second Year and Record, B, 5 units, 32 pp.
Third Year and Record, I, 6 units, 36 pp.
Fourth Year and Record, Plan the Light for Your Home, I, 18 pp.

Leaders Guide for 4-H Advanced Electrical Projects, 4 pp.

(More on this state's material on next page)

217. *KENTUCKY (continued)

4-H Electronics and Record, basic information and two exercises, S, 36, pp.

Selection, Care and Use of Your Electrical Appliances, four phases, S, 20 pp.

You Can Learn Advanced Wiring, for three years, S, 48 pp.; Record Book, 20 pp.

Outdoor and Landscape Lighting for Your Farm and Home, S, 16 pp; Record Book, 4 pp.

Let Your Electric Motors Work for You, three years, S, 32 pp.; Record Book, 16 pp.

218. *LOUISIANA, Louisiana State University, Baton Rouge, 70803

Electric Project Workbook, Unit A, 1st and 2nd year, B, 16 Guide Sheet units, 80 pp.

Electric Project Workbook, Unit B, 3rd and 4th year, I, 16 Guide Sheet units, 72 pp.

Electric Project Workbook, Unit C, 5th and 6th year, S, 19 Guide Sheet units, 120 pp.

219. *MAINE, University of Maine, Orono, 04473

4-H Electric Project, three years of work, B, I, 24 pp., plus a set of Guide Sheets.

4-H Electric Project, three years of work, I, S, 45 pp., plus a set of Guide Sheets.

220. *MARYLAND, University of Maryland, College Park, 20742

Leader's Guide, 4-H Electric Project Program, three phases, 17 pp. mimeo.

Mysterious Electricity, 9 Guide Sheet units, 4 supplemental units, B, 28 pp.

Leader's Guide, Mysterious Electricity, B, 20 pp.

More Power to You Revised, 12 Guide Sheet units, I.

Leader's Guide, More Power to You

The Advanced 4-H Electric Club Project, accompanied by a complete set of Guide Sheets, S, 4 pp.

Project Materials, for youth groups, B, I, S, Edison Electric Institute, see item No. 316.

4-H Electric Project Record, 4 pp.

221. *MASSACHUSETTS, University of Massachusetts, Amherst, 01003

4-H Electric Club Guide Sheet Set, B, I, S.

Do It with Electricity, 4-H Electric Junior Project, I, 54 pp.

4-H TV Electrical Club, B, 12 pp.

Electrical Safety, inspection report, S, to be completed with an adult, 6 x 9, 4 pp.

222. *MICHIGAN, Michigan State University, East Lansing, 48823

Leader's Manual, 4-H Electrical Project, a comprehensive presentation, 32 pp.

The Beginning Electrician, B, Guide Sheets revised and improved, 40 pp.

Junior Electrical Science, I, Guide Sheets and new material, including science and electronics, well illustrated, 20 units, 66 pp.

Senior Electrical Science, Part 1, Electricity, S, 13 units, much new material, 44 pp.

Senior Electrical Science, Part 2, Electronics, S, 8 units, mostly all new material, well prepared, illustrated, and related to the practical. Included are a 4-H test circuit, analog computer, volts, amperes, ohms, capacitance, flasher, repulsion coil, inductance, amplifiers, broadcasters, and receivers.

Leader's Guide, Lamps for 4-H Projects, B, I, instructions, outline information, 3 pp. mimeo.

4-H TV Electrical Club, B, I, 13 club meetings, 13 pp. mimeo.

223. *MINNESOTA, University of Minnesota, St. Paul, 55101

4-H Electrical Bulletin:
Beginner's, B, 17 Guide Sheet units, 66 pp.

Junior, I, 18 Guide Sheet units, 66 pp.

Advanced, S, 18 Guide Sheet units, 74 pp.

224. *MISSISSIPPI, Mississippi State University, State College, 39762

4-H Electric Project Leaders Guide, information and instructions covering the entire program, 30 pp. mimeo.

Electricity Your Helper:
Book 1, B, I, two years, 15 Guide Sheet units, 56 pp.

Book 2, I, S, two years, 10 Guide Sheet units, 40 pp.

4-H Club Electric Project Workbook, a guide to building better records, B, I, S, 15 pp. mimeo.

225. *MISSOURI, University of Missouri, Columbia, 65202

Your 4-H Electric Program, Workbook 1, B, 5 Guide Sheet units and added material, 24 pp.

Your 4-H Electric Program, Workbook 2, I, 10 units with Guide Sheets and added material, 32 pp.

Leaders Guide, instructions, answers, information, demonstrations: Workbook 1, 11 pp.

Workbook 2, 10 pp.

Your 4-H Electric Program, Workbook 3, S, 11 units, much original material, 36 pp.

Leaders Guide, Electricity 3, instructions and information, 4 pp.

Your 4-H Electric Program, Workbook 4, S, 12 units, including Guide Sheets and added material, 20 pp.

226. *MONTANA, Montana State University, Bozeman, 59715

Learning about Electricity, 4-H Unit A, B, 15 Guide Sheet units, 60 pp.

Learning about Wiring, 4-H Unit B, I, 12 Guide Sheet units, 48 pp.

Learning to Use Electricity, Unit C, S, 19 Guide Sheet units, 84 pp.

Learning to Weld Electrically, Unit D, S, 5 Guide Sheet units, 20 pp.

Learning about Electronics, Unit E, S, 6 Guide Sheet units, 26 pp.

227. *NEBRASKA, University of Nebraska, Lincoln, 68503

4-H Electrification Club, 1st year, B, 7 units, 32 pp.

Introducing Your 4-H Electric Project, B, I, two year, 9 Guide Sheet units, 36 pp.

Leaders Guide for 1st Year Electrification Club, 8 pp. mimeo.

Record Book for 1st Year Electrification Club, 8 pp.

Leader's Guide for Advanced 4-H Electrification Projects, 4 pp.

Record Book for Advanced 4-H Electrification Projects, 4 pp.

Good Electric Motor Care, 6 problem workbook, I, S, 24 pp.

Good Wiring, 6 problem workbook, I, S, 30 pp.

4-H Electronics, I, S, 6 Guide Sheet units, 26 pp.

228. *NEVADA, University of Nevada, Reno, 89507

Electricity 4-H, 1st year, B, 40 pp., see California.

More Power to You, see California:
2nd year, B, I, 46 pp.

3rd year, I, 50 pp.

4th year, S, 64 pp.

229. *NEW HAMPSHIRE, University of New Hampshire, Durham, 03824

Basic Electricity, Years I and II, B, 16 Guide Sheet units, 56 pp.

Intermediate Electricity, Years III and IV, I, 21 Guide Sheet units, 74 pp.

4-H Electric Guide Sheets, limited assembly, B, I, S, clip binding.

230. *NEW JERSEY, College of Agriculture, New Brunswick, 08903

Electric Project, Unit 1, B, 4 parts, includes quiz sheets, 34 pp.

Leader's Handbook, information and demonstrations, 10 pp.

Electric Project, Unit 2, I, 4 parts, includes quiz sheets, 40 pp.

Leader's Handbook, Unit 2, information and answers, 12 pp. mimeo.

Electric Motors Unit, Advanced Project, S, 7 Guide Sheet units, 28 pp.

Home Wiring Unit, Advanced Project, S, 8 pp.

Project Record Book, Advanced Projects, 4 pp.

231. *NEW MEXICO, New Mexico State University, University Park, 88070

Basic Electricity, Years I and II, B, 16 Guide Sheet units, 58 pp.

Intermediate Electricity, Years III and IV, I, 21 Guide Sheet units, 74 pp.

Senior Electricity, Years V and VI, S, 25 Guide Sheet units, 100 pp.

Educational level code in this 4-H section

B - Basic
I - Intermediate
S - Senior

232. *NEW YORK, Cornell University, Ithaca, 14850

Electrical Fundamentals, B, 6 items, 24 pp.

Facts about Fuses and Wires, B, I, 6 items, 24 pp.

Facts about Electric Motors, B, I, 5 Guide Sheet units, 20 pp.

4-H Advanced Electric Manual, S, 5 wiring exercises, 12 pp.

Leader's Guide:
Electrical Fundamentals, 7 pp.

Facts about Fuses and Wires, 7 pp.

Facts about Electric Motors, 5 pp.

4-H Advanced Electric, 11 pp.

233. *NORTH CAROLINA, North Carolina State University, Raleigh, 27607

4-H Electric Project 1, B, 8 items, Guide Sheet and new material material, 16 pp.

My 4-H Electrification Project Record, 4 pp.

4-H Electric Project 2, I, 9 items, much new material, 16 pp.

2nd Year Record Book, includes instructions and suggestions, 4 pp.

Advanced Electric Project Record Book, outlines requirements, includes suggestions, 4 pp.

Project Book 3 is in preparation.

234. *NORTH DAKOTA, North Dakota State University, Fargo, 58102

Electricity Unit A, B, 10 Guide Sheet units, includes leader information, 42 pp.

Leaders' Guide, Unit A, gives detail information for each meeting, 22 pp. mimeo.

Electricity Unit B, I, 11 Guide Sheet units, some revisions, 48 pp.

Leaders' Guide, Unit B, gives organization and meeting detail, 24 pp.

Electricity Unit C, S, 11 Guide Sheet units, some revisions, 48 pp.

All materials are 8 1/2" x 11", unless indicated otherwise.

235. *OHIO, Ohio State University, Columbus, 43210

Live and Play the Electric Way with Happy, 1st year, 9 units, B, 40 pp.

Live and Play the Electric Way with Happy, 2nd year, I, 22 pp.

Getting Acquainted with Electricity, I, S, 7 Guide Sheet units, 36 pp.

Live and Play the Electric Way with Happy, Advanced, S, a work outline, 21 pp.

Supplemental Material, by the Cincinnati Gas and Electric Company

Mysterious Magnetism, 1st to 3rd grade, B, simple demonstrations, 15 pp.

The Facinating Atom, 4th to 6th grade, B, electrical concepts, 10 pp.

Understanding the Wonderful World of Electricity, I, 11 Guide Sheet units, 34 pp.

236. *OKLAHOMA, Oklahoma State University, Stillwater, 74075

Electricity Workbook, Unit 1, based on Guide Sheets, B, 24 pp.

Electric Motors, 4-H Electric Leaflet 1, B, I, 22 pp.

Electric Repairing, 4-H Electric Leaflet 2, I, 6 pp.

Electric Heating, 4-H Electric Leaflet 3, I, S, 14 pp.

Appliance Knowledge, 4-H Electric Leaflet 4, I, S, 10 pp.

Planning for Better Electrical Service, 4-H Electric Leaflet 5, I, S, 14 pp.

Electronics, 4-H Electric Leaflet 6, S, 16 pp.

237. *OREGON, Oregon State University, Corvallis, 97331

Let Electricity Do It, Club Series V-5, B, 13 job items, 36 pp.

Electric Magic, Club Series V-6, B, 8 items to do, 16 pp.

Fun with Low Volts, I, 12 job items, 20 pp.

238. *PENNSYLVANIA, Pennsylvania State University, University Park, 16802

Fun with Electricity, 1st year, B, 8 organized meetings, 54 pp.

Leader's Copy, Fun with Electricity, complete details for each meeting, 56 pp.

(More on this state's material on next page)

238. *PENNSYLVANIA (continued)

Fun with Electricity, 2nd Year, I, 8 organized meetings, 68 pp.

Leader's Copy, Fun with Electricity, 2nd Year, details for each meeting, 72 pp.

Learning about Electronics, 4-H Electric, S, 6 Guide Sheet units, 32 pp.

239. *PUERTO RICO, University of Puerto Rico, Box 607, Rio Piedras, 00927

Como hacer una ESTUFA electrica, B, 4 pp. mimeo.

Manual de Electrificacion Rural, B, 6 pp. mimeo.

Interesting separates also in Spanish:

Uso y Cuidado de la Plancha Electrica, B, 6 x 9, 12 pp.

Como Tartar y Conservar Un Acumulador O Bateria, B, 6 x 9, 8 pp.

Como Leer El Contador Electrico de Su Casa, B, 6 x 9, 16 pp.

Evite Accidentes Con, Corriente Electrica, B, 6 x 9, 16 pp.

240. *RHODE ISLAND, University of Rhode Island, Kingston, 02881

4-H Electric Project program, based on Guide Sheets.

Leader's notebook cover, courtesy of electric power suppliers.

241. *SOUTH CAROLINA, Clemson University, Clemson, 29631

4-H Electric Project:
Unit 1, B, 13 items, much original work, 60 pp.

Unit 2, I, 14 items, much original work, 78 pp.

Unit 3, S, 13 items, much original work, 112 pp.

Electric Welding, for 4-H Electric, S, 5 Guide Sheet units, 20 pp.

4-H Electronics, S, 6 Guide Sheet units, 24 pp.

242. *SOUTH DAKOTA, South Dakota State University, Brookings, 57007

4-H Electric Project:
Book 1, B, 14 Guide Sheet units, 3 added units, 52 pp.

Book 2, I, 15 Guide Sheet units, 3 added units, 74 pp.

Book 3, S, 26 units, a combination of Guide Sheets and revised and new material, 132 pp.

(More on this state's material on next page)

242. *SOUTH DAKOTA (continued)

County 4-H Electric "Box of Kits", the list sheet is available. A footlocker 4-H Electric "Box of Kits" is available in the counties. The set of kits is intended for club and project leaders to borrow and show at meetings. The list sheet gives purchase information.

243. *TENNESSEE, University of Tennessee, Box 1071, Knoxville, 37901

Electric Workbook, 4-H, B, 6 Guide Sheet units, record, 44 pp.

Electric Workbook, 4-H, B, I, 6 Guide Sheet units, record, 42 pp.

Electric Workbook, 4-H, I, S, 6 Guide Sheet units, record, 42 pp.

4-H Electric Project Workbook, Division B, Units 4 and 5, 24 Guide Sheet units, record, 74 pp.

244. *TEXAS, Texas A & M University, College Station, 77843

Member Guide, 4-H Electric:
Unit 1, B, 10 Guide Sheet lessons, 40 pp.

Unit 2, I, 10 Guide Sheet lessons, 42 pp.

Unit 3, S, 10 Guide Sheet lessons, 44 pp.

Soldering and Welding, Member Guide, Unit 4, S, 6 Guide Sheet lessons, 28 pp.

Motors, Member Guide, Unit 5, I, S, 8 Guide Sheet lessons, 32 pp.

Electronics, Member Guide, Unit 6, S, 6 Guide Sheet lessons, 28 pp.

Leader Guide, Electric Project, planning meetings and materials, 9 pp.

4-H Electric Demonstrations, Member Guide, information and references, 8 pp.

4-H Electric Demonstrations, Leader Guide, planning and selecting, 8 pp.

Record Book for 4-H Electric Program, 8 pp., for each unit.

Guide Sheets are available to supplement workbook lessons

245. *UTAH, Utah State University, Logan, 84321

Exploring Electricity with Sparky, B, much original preparation, 30 pp.

Leader's Guide, 1st year, suggestions and resources, 8 pp.

Exploring Electricity, Phase II, much original material, I, 24 pp.

245. *UTAH (continued)

Exploring Electricity, Phase III, S, Guide Sheets, new material, 36 pp.

Electronics, 4-H Electric advanced, S, 6 Guide Sheet units, 26 pp.

Electric Project, Phase IV, Lighting, S, 1 pp. mimeo.

246. *VERMONT, University of Vermont, Burlington, 05401

4-H Electric Club Program uses Guide Sheets.

247. *VIRGINIA, Virginia Polytechnic Institute, Blacksburg, 24061

Facts and Ideas, 4-H Electric Unit 1, B, 5 Guide Sheet units, 16 pp.

4-H Electric Project Record Book, Unit 1, 8 pp.

4-H Electric Project Record Book, Unit 2, includes requirements and references, 10 pp.

Electricity on the Farm and in the Home, Circular 523, 6 pp.

Some Do's and Don'ts for Home Lighting, Circular 495, 4 pp.

Care of Home Electrical Equipment, Circular 661, 10 pp.

Care of Farm Electrical Equipment, Circular 617, 8 pp.

195 Topics for 4-H Electric Demonstrations, ME-8, 5 pp.

248. *WASHINGTON, Washington State University, Pullman, 99163

An Introduction to Electricity, 4-H Electric Unit 1, B, 8 Guide Sheet lessons, 38 pp.

Electricity around the Farm and Home, Unit 2, B, I, 7 Guide Sheet lessons, 34 pp.

Electricity Working for You, Unit 3, I, 6 Guide Sheet lessons, 28 pp.

Safe and Efficient Use of Electricity, Unit 4, I, S, 8 Guide Sheet lessons, 42 pp.

249. *WEST VIRGINIA, West Virginia University, Morgantown, 26506

Watt Fun:

4-H Electric No. 1, B, 12 items, includes Record, 40 pp.

4-H Electric No. 2, I, 20 items, includes Record, 3 Guide Sheets, 48 pp.

4-H Electric No. 3, S, 18 items, includes Record, 44 pp.

You Can Weld Electrically, Project in 5 parts, each with a Record of Activities, S, 12 pp. each.

4-H Electronics Projects 1 through 6, S, each with a Record of Activities, uses Guide Sheets, 12 pp. each.

250. *WISCONSIN, University of Wisconsin, Madison, 53706

Exploring with Electricity, B, ten things to do, (4 pp. Leader's Guide) 20 pp.

Watts and Wires, I, 10 things to do,(4 pp. Leader's Guide) 26 pp.

The World of Light, mostly S, 16 things to do,(4 pp. Leader's Guide) 30 pp.

Electric Heat and Power, S, 17 things to do,(1 sheet Leader's Guide) 26 pp.

251. *WYOMING, University of Wyoming, Box 3354, University Station, Laramie, 82071

4-H Electric, Basic Unit, 12 Guide Sheet units, 44 pp., Record Book, 12 pp.

4-H Electric, Intermediate unit, 13 Guide Sheet units, 48 pp., Record Book, 18 pp.

4-H Electric, Advanced unit, S, 16 things to do, 40 pp., Record Book, 8 pp.

Wyoming 4-H Electrical Living Series, I, S:
Getting Acquainted with Electricity, 30 pp.; Leaders' Guide, 4 pp.; Record Book, 11 pp.

Electricity and Foods, 13 pp.; Leaders' Guide, 22 pp.; Record Book, 13 pp.

Electricity and Clothing, 14 pp.; Leaders' Guide, 17 pp.; Record Book, 12 pp.

Lighting, 45 pp.; Leaders' Guide, 6 pp.; Record Book, 13 pp.

252. *4-H ELECTRIC PROGRAM GUIDE SHEET LIST, a list and classification, National 4-H Service Committee, 59 East Van Buren Street, Chicago, Ill. 60605.

Guide Sheets are "building blocks" for 4-H member material, available in reproduction proof form, as singles, and as groups (in pre-assembled member books). List indicates which of these have companion Leaders' Guides. Also indicates how to order and prices.

253. *4-H ELECTRIC PROGRAM HANDBOOK, 3 ring, 2 inch, hard back binder 11 x 12, approximately 70 pages, $3.00, Westinghouse Electric Corporation, #SA9809, c/o National 4-H Service Committee, 59 East Van Buren Street, Chicago, Ill. 60605.

This handbook was developed by the National 4-H Electric Program Committee to help advance the 4-H Electric Program, and made available by the National Donor, Westinghouse Electric Corporation. It is for use by by State and County Extension personnel, cooperating Electric Power Suppliers, State and County 4-H Electric Program chairmen and coordinators.

Cross Reference Items -- See these Numbers

under VOCATIONAL AGRICULTURE: Technical

7. Electric Motors for the Farm, S, Edison Electric Institute, New York.

8. Aids to Using Electricity on Indiana Farms, S, State Supervisor of Agricultural Education, Indianapolis, Ind.

16. Electric Motors for Farm Use, S, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

17. Electrical Controls Kit Materials, S, four items, Vocational Agriculture Service, Urbana, Ill.
    1. Applying Electrical Controls in Farm Production
    2. Suggestions to the Teacher
    3. Exercises for Use with Electrical Controls Kit
    4. Slide Film, showing unpacking and checking controls

20. Farm Electrification for Vocational Agriculture, I, S, New Jersey Department of Education, Trenton, N. J.

21. Suggestions for Teaching Farm Electrification, I, S, Edison Electric Institute, New York, N. Y.

22. Electrical Wiring--Fundamentals and Planning, I, S, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

23. Electrical Wiring--Procedures and Exercises, S, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

24. Electrical Hazards on the Farm, I, S, Vocational Agriculture Service, University of Illinois, Urbana, Ill.

27. Farm Electrification, I, S, Central Power and Light Company, Corpus Christi, Texas.

28. Adult Farm Electrification Course, S, Central Maine Power Company, Augusta, Me.

29. Electrical Controls on the Farm, S, Alabama Power Company, Birmingham, Ala.

31. Farm Electrification Course, S, Connecticut Light and Power Company, Hartford, Conn.

32. Electrical Fundamentals Booklet, B, I, S, Agricultural Engineering Department, University of Massachusetts, Amherst, Mass.

4-H Educational Level Code

B - Basic
I - Intermediate
S - Senior

This has been applied to Cross Reference items on pp. 50-58. In their regular listings, these items are coded according to the other system.

Cross Reference Items -- See these Numbers

under VOCATIONAL AGRICULTURE: Electrification Course Outlines

73. Basic Electricity, S, United States Department of Agriculture, Washington, D. C.

74. Basic Electronics, S, United States Department of Agriculture, Washington, D. C.

76. Electrical Tips for Everyone, S, Department of Agricultural Education, Pennsylvania State University, University Park, Pa.

Cross Reference Items -- See these Numbers

under VO-TECH and TRADE & INDUSTRY: Electrical Course Outlines

156. Bulletin of North Georgia Technical and Vocational School, S, Clarksville, Ga.

158. Apprentice Inside Wiremen, Instruction Outline, S, Wisconsin Board of Vocational, Technical, and Adult Education, Madison, Wis.

166. Course of Study Outline, Industrial Electricity, S, Sussex County Vocational-Technical Center, Georgetown, Dela.

167. Electricity and Electronics, self study course, S, General Electric Company, nearest General Electric Major Appliance Distribution House.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Demonstration Boards and Work Kits

304. Demonstration Manual, Electrical Distribution and Use, I, S, Ohio Edison Company, Canton, O.

306. Demonstrations in Farm and Home Lighting, B, I, Michigan State University, East Lansing, Mich.

307. Lighting Demonstrations, B, I, S, Kansas Inter-Industry Farm Electric Utilization Council, Manhattan, Kan.

308. Demonstration Manual, I, S, same as Item No. 304 except it includes construction plans and materials list, Cooperative Extension Service, Ohio State University, Columbus, O.

310. Demonstration Manual, Fundamentals of Farm Wiring, S, Kansas State University, Manhattan, Kan.

311. Fundamentals of Electricity, I, S, Connecticut Light and Power Company, Hartford, Conn.

312. Reddy-Made Demonstrations, B, I, S, Central Power and Light Company, Corpus Christi, Texas.

313. Selected Teaching Demonstrations in Agricultural Mechanics, I, S, College of Agriculture, Cornell University, Ithaca, N. Y.

314. Battery Charger Kit, I, S, Agricultural Engineering Department, University of Connecticut, Storrs, Conn.

315. Electric Demonstration Kit, S, Electro-Tech, Inc., Hapeville, Ga.

316. Project Materials, B, I, S, Edison Electric Institute, New York, N.Y.

317. Catalog, B, I, Edmund Scientific Company, Barrington, N. J.

318. Ventura Wire.Motor, B, I, University of California, Berkeley, Cal.

319. Voltage-Tester-110-220, I, S, Agricultural Extension Service, University of California, Berkeley, Cal.

320. 4-H Electric Circuit Kit, B, I, Agricultural Extension Service, University of California, Berkeley, Cal.

321. Electrical Projects, B, I, Lyon Rural Electric Company, San Diego, Cal.

322. Magnets Book-Lab Set and Teacher Manual, B, NASCO, Fort Atkinson, Wis.

323. Working with Light, I, S, Better Light Better Sight Bureau, New York, N. Y.

324. Home Lighting Activities Book, I, S, Better Light Better Sight Bureau, New York, N. Y.

326. Electrical Projects for Farm Youths, I, S, New England Power Service Company, Clinton, Mass.

327. Basic Electricity from the Junk Box, B, I, National Rural Electric Cooperative Association, Washington, D. C.

328. Experimenting with Electricity, B, I, S, Alabama Power Company, Birmingham, Ala.

329. Electric Motor Project, B, I, Connecticut Power and Light Company, Hartford, Conn.

330. Educational Aids for Youth, B, I, S, Agricultural Engineering Department, University of Massachusetts, Amherst, Mass.

331. Projection Meters, for use with overhead projector, Central Scientific Company, Mountainside, N. J.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Charts

351. Generation, Transmission, and Distribution of Electricity, B, I, S Alabama Power Company, Birmingham, Ala.

352. Lead Type Storage Battery, parts and operation, B, I, S, Electric Storage Battery Company, Philadelphia, Pa.

353. Electric Projects for Farm Youth, B, I, S, Edison Electric Institute, New York, N. Y.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Movie Films

361. Adequate Wiring, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

362. Automatic Controls, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

363. Mechanical Poultry Equipment, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

364. Hog Feeding, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

365. Materials Handling for a Beef Layout, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

366. Materials Handling for a Dairy Layout, S, 14 1/2 minutes, B/W, Michigan State University, East Lansing, Mich.

367. The Wonder-Filled Age of Electricity, B, I, S, 20 minutes, color, National Electrical Manufacturers Association, New York, N. Y.

368. Electricity at Work, B, I, S, 15 minutes, color, sound, Department of Agricultural Engineering, Michigan State University, E. Lansing.
1. Putting Electrons to Work
2. Understanding Volts, Amperes, and Ohms
3. Using Ohm's Law to Understand Circuits
4. Watts, Watthours, Watthour Meters
5. Mechanical Generation of Electricity
6. How Transformers Work
7. The 120/240 Volt 3-Wire System
8. Understanding Branch Circuits
9. Understanding Common Induction Motors
10. Starting Characteristics of Common Induction Motors

369. Farm Better Electrically, I, S, 27 minutes, Edison Electric Institute, New York, N. Y.

370. Farm Mechanization Electrically, I, S, 15 minutes, color, Iowa State University, Ames, Iowa.

371. Principles of Electricity, B, I, S, 20 minutes, General Electric Educational Films, New York, N. Y.

372. A Is for ATOM, I, S, 15 1/2 minutes, General Electric Educational Films, New York, N. Y.

373. Electrical Safety in the Home, B, I, S, color, Stout State University, Menomonie, Wis.

374. My Pop's A Lineman, B, I, S, color, Stout State University, Menomonie, Wis.

375. Electric Circuits, B, B/W, McGraw-Hill Book Company, New York.

376. Our World of Electricity, B, five films, Cenco Educational Films, Chicago, Ill.

378. Matter and Energy (electricity), three films, B, color, Encyclopaedia Britannica Educational Corporation, Chicago, Ill.

380. Electricity--Distribution, I, S, color, Indiana University, Bloomington, Ind.

381. Electricity--Measurement, I, S, color or B/W, Indiana University, Bloomington, Ind.

382. Electricity--Static Electricity, B, I, color or B/W, Indiana University, Bloomington, Ind.

383. Electricity--Production, I, S, color or B/W, Indiana University, Bloomington, Ind.

384. Electricity--from Power Plant to Home, B, I, S, color or B/W, McGraw-Hill Book Company, New York, N. Y.

385. Electromagnets, B, I color or B/W, McGraw-Hill Book Company, New York, N.Y.

386. The Flow of Electricity, B, I, S, color or B/W, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under VISUAL AIDS: Filmstrips

401. Farm Electric Motors, Selection, Protection, and Drives, I, S, 68 frames, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

402. How Farm Electric Motors Start and Run, I, S, 86 frames, American Association for Agricultural Engineering, and Vocational Agriculture, Athens, Ga.

403. Electrical Terms and Their Meaning and Use, B, I, 89 frames, American Association for Agricultural Engineering, and Vocational Agriculture, Athens, Ga.

404. Understanding Electricity, B, I, S, Society for Visual Education, Inc., Chicago, Ill.
- 412-1 How Radio and Radar Work, 59 frames, 14 minutes.
- 412-2 How Electricity Is Produced, 61 frames, 14 minutes.
- 412-3 Producing Static Electricity, 59 frames, 13 minutes.
- 412-4 Electric Circuits and How They Work, 58 frames, 6 to 12 1/2 minutes.

405. Electric Circuits, B, I, 57 frames, Society for Visual Education, Chicago, Ill.

406. The Principles of Electric Motors and Generators, S, 68 frames, Society for Visual Education, Chicago, Ill.

407. Learning Arc Welding Skills, S, set of three, James F. Lincoln Arc Welding Foundation, Cleveland, O.

410. Electrical Welding, Learning and Application, I, S, six filmstrips, University of Illinois, Urbana, Ill.

411. DC and AC Motor Theory, Testing, Connecting and Trouble Shooting, S, four filmstrips, B/W, University of Illinois, Urbana.

<u>Cross Reference Items</u> -- See these Numbers

under VISUAL AIDS: Slides, Overhead Projector Transparencies

451. The Electrification Farm Story, I, S, Edison Electric Institute, New York, N. Y.

452. The Fundamentals of Electricity, I, S, Michigan State University, East Lansing, Mich. Items used as teaching aids:
1. Putting Electrons to Work
2. Mechanical Generation of Electric Power
3. How A Transformer Works
4. Common Induction Motors: Types and Their Differences

453. Electricity for Home Use, I, S, North Dakota State University, Fargo, N. D.

454. Milk House Score Card, S, Department of Agricultural Education, Pennsylvania State University, University Park, Pa.

455. What Is Your CASE with Electricity? S, Department of Agricultural Education, Pennsylvania State University, University Park, Pa.

457. How Electricity Performs. S, electrical understanding, 6 sets, Michigan State University, East Lansing, Mich.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Textbooks and Booklets

501. Electrical Terms, Their Meaning and Use, B, I, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

502. Fundamentals of Electricity and Magnetism, B, I, S, Delco-Remy Division, General Motors, Inc., Anderson, Ind.

503. Living with Electricity, I, S, Dayton Power and Light Company, Dayton, O.

504. Aids to Using Electricity on Indiana Farms, I, S, Purdue University, Lafayette, Ind.

505. Basic Electricity and An Introduction to Electronics, S, Howard W. Sams and Company, Inc., Indianapolis, Ind.

506. ABC's of Electricity, I, S, Howard W. Sams and Company, Inc., Indianapolis, Ind.

507. Practical Science Projects in Electricity/Electronics, I, S, Howard W. Sams and Company, Inc., Indianapolis, Ind.

513. Programmed Basic Electricity Course, I, S, Theodore Audel and Company, Indianapolis, Ind.

515. Selected References and Aids Useful in Teaching Agricultural Mechanics, Agricultural Education, N. Y. State College of Agriculture, Cornell University, Ithaca, N. Y.

517. ABC's of Electric Motors and Generators, S, Howard W. Sams and Company, Inc., Indianapolis, Ind

518. Learning Electricity Fundamentals, S, Howard W. Sams and Company, Ind., Indianapolis, Ind.

519. Electrical Textbook for Farming and Home-Making, S, The S. D. Rural Electric Association, Inc., Huron, S. D.

521. Practical Electric Wiring, Richter, S, McGraw-Hill Book Company, New York, N. Y.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Handbooks, Manuals, and Guides

552. Farm Wiring System, S, Iowa Southern Utilities Company, Centerville, Iowa.

553. Farmstead Wiring Handbook, S, Farm Electrification Council, Oakbrook, Ill.

554. Simplified Electric Wiring Handbook, S, Sears, Roebuck and Company, local.

556. Maintaining the Home Lighting and Wiring System, I, S, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

557. Farm Electric Motors, Selection, Protection, Drives, S, American Association for Agricultural Engineering and Vocational Agriculture, Athens, Ga.

559. Care of Electric Motors, A Guide, S, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

565. Fundamentals of Good Lighting, Camp Counselor's Manual, B, I, S, Connecticut Light and Power Company, Hartford, Conn.

566. Arc Welding Manual, S, James F. Lincoln Arc Welding Foundation, Cleveland, O.

571. The How and Why Wonder Book of Electricity, B, Wonder Books, New York, N. Y.

572. Electricity in Your Life, B, Prentice-Hall, Inc., Englewood Cliffs, N. J.

573. A First Electrical Book for Boys, B, I, Charles Scribner's Sons, New York, N. Y.

574. The Boy Electrician, B, I, Lothrop, Lee, and Shepard, New York.

575. Electricity in the Home and on the Farm, S, John Wiley and Sons, Inc., New York, N. Y.

576. Rural Electrification, S, The Bruce Publishing Company, Milwaukee, Wis.

578. Primer of Lamps and Lighting, S, Sylvania Electric Products, Inc., New York, N. Y.

579. Competitive Reference Manual, S, Southeastern Electric Exchange, Atlanta, Ga.

Cross Reference Items -- See these Numbers

under TEXTBOOKS: Bulletins and Circulars

601. Fundamentals of Good Lamp Building, B, I, Alabama Power Company, Birmingham, Ala.

602. Improving Study Lighting, B, I, S, Cooperative Extension Service, Oklahoma State University, Stillwater, Okla.

603. Choosing and Using Portable Lamps, I, S, Oklahoma State University, Stillwater, Okla.

604. Lighting for Better Living, B, I, Better Light Better Sight Bureau, New York, N. Y.

605. Working with Light, I, S, Better Light Better Sight Bureau, New York, N. Y.

606. Farm Electric Motors, S, Book Department, Electricity on the Farm, New York, N. Y.

607. Single-Phase Electric Motors for Farm Use, S, United States Department of Agriculture, Washington, D. C.

608. Electrodes for Farm Arc Welding, S, North Dakota State University, Fargo, N. D.

609. Teacher's Guidebook for Living with Light, S, Better Light Better Sight Bureau, New York, N. Y.

611. Electrical Safety Leaflets, S, Connecticut Light and Power Company, Hartford, Conn.

613. Safety Grounding, leaflet, I, S, Alabama Power Company, Birmingham, Ala.

## Demonstration Boards and Work Kits

301. *FARM ELECTRIFICATION TEACHING AIDS, S, PS, 8 1/2 x 11, 50 pp., 1962, The Dayton Power and Light Company, 25 North Main Street, Dayton, Ohio 45401.

The demonstrations and work problems given are to be used in conjunction with the Vocational Agriculture Electrical Cabinet. The series of demonstrations covers principles of electricity, wiring, and operation of switches, installing and operating electrical outlets, and selecting, operating and caring for electric motors. Plans and specifications for building the cabinet and acquiring the equipment are included.

302. *SUGGESTIONS FOR TEACHING FARM ELECTRIFICATION, S, PS, 8 1/2 x 11 spiral bound, 45 pp., revised as needed, Agricultural Development Section, Carolina Power and Light Company, Raleigh, N. C. 27602.

This guide outlines eight demonstrations for use with a panel board. A series of seven lesson outlines follows on motor selection, operation, and maintenance, motor controls and automatic controls. It also includes a list of materials for the controls, and other items for the electric teaching center, plus prices.

303. *PRACTICAL FARM WIRING DEMONSTRATIONS, Curtis R. Weston and Missouri Farm Electrification Council, Inc., S, PS, 8 1/2 x 11 litho., 1966, Department of Agricultural Education, University of Missouri, 122 Waters Hall, Columbia, Mo. 65201.

This text was prepared to assist vocational agriculture teachers and others interested in rural youth to demonstrate adequate and safe electric wiring, as well as to teach proper selection, operation, and care of electric motors. It is designed for use with demonstration panels. Details for the performing of each demonstration are given with explanatory comments.

304. *DEMONSTRATION MANUAL, for teaching the fundamentals of electrical distribution and use, Ohio Farm and Home Electrification Council, Inc., S, PS, 8 1/2 x 11 spiral bound, 1964, Ohio Edison Company, 47 Main Street, Akron, O. 44308.

This demonstration manual shows pictures of the demonstration board, lists many materials, and gives ten lessons accompanied by the demonstrations for each.

305. *AN ELECTRIC WORK CENTER, for the Vocational Agriculture Shop, Progress Report No. 107, R. N. Jones, E. F. Olver, D. R. McClay, and F. Anthony, S, PS, 8 1/2 x 11 printed, 8 pp. 1953, $0.15, Pennsylvania State University, School of Agriculture, University Park, Pa. 16802.

This circular gives a detail tools list and lists equipment for an electric work center. The center can be used for demonstration and teaching.

306. *DEMONSTRATIONS IN FARM AND HOME LIGHTING, Raymond M. Clark, Agricultural Education, and Dennis Wiant, Agricultural Engineer, P, S, 8 1/2 x 11 mimeo., 13 pp., 1958, Raymond M. Clark, Agricultural Education, College of Education, Erickson Hall, Michigan State University, East Lansing, Mich. 48823.

Nine demonstrations covering spectrum, quantity, color, shadows, direction, glare, quality, and plant growth are explained.

307. *LIGHTING DEMONSTRATIONS USING 'KIIFEUC' LIGHTING KITS, P, S, PS, 8 1/2 x 11 mimeo., c/o Kansas Farm Electrification Council, Agricultural Engineering Department, Kansas State University, Manhattan, Kans. 66502.

The guide outlines nine demonstrations covering glare, contrast, fixture, valance, recipe for reading with a table lamp, Poldon table lamp with three shades, vanity lamp shade, study using pin-to-wall lamps, and wall bracket. A separate 14-page script is available for use with the demonstration outlines.

308. *DEMONSTRATION MANUAL for Teaching the FUNDAMENTALS OF ELECTRICAL DISTRIBUTION AND USE, J. Carroll Novestine, PS, 8 1/2 x 11, 28 pp., Cooperative Extension Service, Ohio State University, Columbus, Ohio 43210.

This material was prepared in cooperation with the Ohio Farm and Home Electrification Council. The manual provides teaching demonstrations on farm wiring organized for teachers, electric power suppliers and others instructing farm people, equipment dealers, or wiremen on farm electrical problems. Also includes diagrams and bills of material for demonstration wiring board and its panels.

309. *ELECTRICAL DEMONSTRATION CENTER, Cooperatively developed, S, PS, 8 1/2 x 11, 41 pp., 1959, The Vermont Department of Education, Agricultural Education Service, State House, Montpelier, Vt. 05601.

The publication contains construction details and plans for using the 5' x 2' x 2' demonstration center. Seven small panels are used to effectively demonstrate principles and practices in electricity.

310. *DEMONSTRATION MANUAL for teaching the FUNDAMENTALS OF FARM WIRING, Ralph I. Lipper, Assistant Professor, and Kenneth A. Harkness, Research Engineer, S, PS, 8 1/2 x 11, mimeo., 46 pp., Cooperative Extension Service, Kansas State University, Umberger Hall, Manhattan, Kan. 66502.

This demonstration guide details a program centered around a demonstration panel and suggests interesting demonstrations that can be performed with it. It is a primary source book for information on planning or how to perform wiring skills.

311. *FUNDAMENTALS OF ELECTRICITY DEMONSTRATION, Connecticut Farm Electrification Council, P, S, 8 1/2 x 11, 42 pp., 1962, Connecticut Light and Power Company, Farm Service Department, P. O. Box 2010, Hartford, Conn. 06101.

This spiral bound booklet consists of fourteen units, simply described demonstrations, to be used with a small demonstration panel.

312. *REDDY MADE DEMONSTRATIONS, P, S, 8 1/2 x 11 litho., 1966, Central Power and Light Company, P. O. Box 2121, Corpus Christi, Texas 78403.

This booklet contains a program for a 4-H Electric Field Day. It outlines six demonstrations: decorate with light, small motor protection, build a portable patio lamp, live better electrically, lighting for televiewing, and black light insect traps. It also gives suggestions in how to give a demonstration.

313. *SELECTED TEACHING DEMONSTRATIONS IN AGRICULTURAL MECHANICS, S, 8 1/2 x 11, 18 pp., 1965, Rural Education Department, Agricultural Education, Cornell University, Ithaca, N. Y. 14850.

Only one item is electric. This item on pages 10-11, Operating the Carbon Arc Torch, gives objectives, materials needed, steps in demonstrating, keypoints, and information.

314. *BATTERY CHARGER KIT, S, 8 1/2 x 11, 6 pp., 1966, Agricultural Engineering Department, University of Connecticut, Storrs, Conn. 06268.

A battery charger made from this kit may be used to rejuvenate flashlight cells and transistor radio batteries. The kit consists of items shown on a bill of materials. A list of tools needed and steps in assembling along with a wiring diagram are included.

315. ELECTRIC DEMONSTRATION KIT, S, PS, write for information and prices, Electro-Tech, Inc., 3020 Commerce Way, Hapeville, Ga. 30054.

A simplified kit designed for teaching basic electricity. It includes 11-inch voltmeter, ammeter and watt-meter with special large numerals readable as far as 20 feet away. All wiring is exposed to class view. It is assembled and recommended by the American Association for Agricultural Engineering and Vocational Agriculture.

316. *PROJECT MATERIALS, for Youth Group Workshop Activities, P, S, 8 1/2 x 11, 30 pp., 1967, $1.50 single copy to non-members, Edison Electric Institute, 750 Third Avenue, New York, 10017.

The publication lists "Do It Yourself" electrical kits produced by manufacturers. It is prepared to assist those working with young people to locate kits for assembly. The list includes lighting, fundamentals of electricity, hot beds, motors, generators, radio and electronics, soldering iron, extension cords, and other miscellaneous items.

317. *CATALOG, Edmund Scientific Company, P, S, 5 x 8 1/2, 148 pp., Edmund Scientific Company, Barrington, N. J. 08007. The same catalog is also available from American Science Center, Inc., 5700 N. Northwest Highway, Chicago, Ill. 60646.

Items are described as being in the "Science-Optics Mathematics for Hobbyists, Industry, and Schools", and consist of new and surplus items, some listed at what they term "bargain" prices. Current issue contains a few items that might be useful in teaching 4-H or Vocational Agriculture classes in electricity.

318. *VENTURA WIRE MOTOR, P, S, 8 1/2 x 11, 6 pp., 1965, limited supply, Agricultural Extension Service, 2200 University Avenue, University of California, Berkeley, Cal. 94720.

In the leaflet, construction directions are given for making a home-made motor which will run on one or two D batteries. Illustrations and instructions are in detail. The Kit is available from Lyon Rural Electric Company, P. O. Box 30, San Diego, Cal. 92112.

319. *VOLTAGE TESTER 110/220, 4-H Electric Project, S, 8 1/2 x 11, 4 pp., 1966, limited supply, Agricultural Extension Service, 2200 University Avenue, University of California, Berkeley, Cal. 94720.

The leaflet lists materials needed and gives assembly directions; the kit of parts is available from Lyon Rural Electric Company, P. O. Box 30, San Diego, Cal. 92112. The 4-page leaflet by Robert Davis and D. L. Cousins of California, who designed the tester, is most complete and desirable in connection with the kit.

320. *4-H ELECTRIC CIRCUIT KIT, P, S, 8 1/2 x 11, 5 pp., 1965, limited supply, Agricultural Extension Service, 2200 University Avenue, University of California, Berkeley, Cal. 94720.

The 5-page information and construction leaflet is in detail and well prepared. It lists kit contents and gives directions for assembling. It also outlines how to wire for series and parallel circuits. The kit is available from Lyon Rural Electric Company, P.O.Box 30, San Diego, Cal.92112.

321. *ELECTRICAL PROJECTS, for Youth, Fairs, or Classes, P, S, 8 1/2 x 11, 4 pp., 1966, Lyon Rural Electric Company, P.O.Box 30, San Diego, Cal. 92112.

This circular describes 21 items of interest to both 4-H electric project members and vo-ag students. The items may be used as camp projects or member projects. A reference to sources of literature is given.

322. *MAGNETS BOOKLAB SET AND TEACHERS MANUAL, Science in 4-H, 8 1/2 x 11, 48 pp., guide and accompanying kit, $2.50, teachers guide, $0.50, NASCO, Fort Atkinson, Wis. 53538.

This kit includes marked and unmarked magnets, non-magnetic materials, compasses and other items. Attraction, repulsion, discovering polarity, strength of magnets, and the compass and earth's magnetism can be studied and demonstrated.

323. *WORKING WITH LIGHT, Construction Projects, S, 8 1/2 x 11, 4 pp. each, 1963, Better Light Better Sight Bureau, 750 Third Avenue, New York, N. Y. 10017.

This set of 12 lighting projects is complete with instructions and diagrams for: table lamp in wood, table lamp in metal, floor lamp, fluorescent bare-lamp channel, driveway light, wall lamp, table lamp with ceramic base, the industrial fixture, the 3-ring fixture, valance, cove and cornice lighting, garden light, and lamp shades.

324. *HOME LIGHTING ACTIVITIES BOOK, P, S, 8 1/2 x 11, 22 pp., 1963, Better Light Better Sight Bureau, 750 Third Avenue, New York, N. Y. 10017.

This booklet is a study unit in home lighting and is a good demonstration guide. Pages are perforated so that they can be removed from the book and various activities carried out by small groups. Each page covers one or more useful points to know about light.

326. *ELECTRICAL PROJECTS FOR FARM YOUTHS, P, S, 8 1/2 x 11, 28 pp., 1962, free, Agriculture Development Department, New England Power Service Company, 216 High St., Clinton, Mass. 01510.

Twenty-seven simplified electric projects that could be built in the classroom are described: (with diagrams) chick brooders, electric hotbed, extension cords, infra-red electric heat lamp, lighting, motor applications, paint softener, pig brooder, poultry equipment.

327. *BASIC ELECTRICITY FROM THE JUNK BOX, P, 8 1/2 x 11, 8 pp., 1966, Member Services Division, National Rural Electric Cooperative Association, 2000 Florida Avenue N.W., Washington, D. C. 20009.

It is a two-part illustrated leaflet for use by the instructor in demonstrating such things as electrons forced through a circuit, thermo-couple, electric eye, magnetism, circuits, voltage, alternating current, etc., with simple items collected from "the junk box".

328. *EXPERIMENTING WITH ELECTRICITY, P, S, 8 1/2 x 11 printed, 40 pp., Rural Sales Section, Alabama Power Company, Birmingham, Ala. 35202.

This volume shows how to set up and give some 40 electricity demonstrations that also are a part of individual learning and experimenting. It starts with the simple dry cell and concludes with the construction of an electric brazing torch.

329. *ELECTRIC MOTOR PROJECT, Fundamentals of Electric Motor Operation, P, 8 1/2 x 11, 8 pp., 1964, Connecticut Light and Power Company, Farm Service Department, P. O. Box 2010, Hartford, Conn. 06101.

A 4-H project to teach fundamentals of electric motor operation. It includes principles of electric motors and how they operate; also, the construction of a small, direct-current electric motor.

330. *EDUCATIONAL AIDS FOR YOUTH, P, S, PS, 8 1/2 x 11, 6 pp., a paper by Mr. E. S. Pira, Associate Professor, Agricultural Engineering Department, College of Agriculture, University of Massachusetts, Amherst, Mass. 01003.

This paper describes ten teaching aids which can be readily assembled from parts generally available at little cost. It is recommended that these demonstrations be used with the booklet "Electrical Fundamentals", Bibliography Item No. 32.

331. PROJECTION METERS (AMMETER AND VOLTMETER), S, PS, size 3 3/4 x 4 1/4 x 1 3/4 inches, for use with overhead projector, Central Scientific Company, 237 Sheffield Street, Mountainside, N. J. 07092.

The projection meters for AC and DC voltage and current measurements can be used in pairs on overhead projectors with a 10 x 10 inch projection area. A multiplier and shunt with panel switches is available to make the meters more versatile. Write for catalog and prices.


For Vo-Ag materials -- see the BLUE section

For Vo-Tech materials -- see the GOLDENROD section

For 4-H materials -- see the GREEN section

For visual aids -- see the PINK section

For textbooks -- see the YELLOW section

Charts

351. *GENERATION, TRANSMISSION, AND DISTRIBUTION OF ELECTRICITY, P, S, 11 x 14, 9 pp., free to Alabama educators, Alabama Power Company, Box 2641, Birmingham, Ala. 35202.

This set of nine cards showing distribution of electricity can be used singly or in a group.

352. *PARTS AND ASSEMBLY OF A LEAD TYPE STORAGE BATTERY, P, S, PS, 21 x 27, compliments of the Electric Storage Battery Company, P. C. Box 5723, Philadelphia, Pa. 19120.

In addition to parts illustrations and information, the chart shows and tells how a storage battery works.

353. *ELECTRICAL PROJECTS FOR FARM YOUTH, 8 1/2 x 11 plan sheets, P, S, Edison Electric Institute, 750 Third Avenue, New Y York, N. Y. 10017.

Volume I, Publication No. 53-19, includes 27 plan sheets for constructing or assembling farm and home electrical equipment. Price $1.50 for EEI members, $2.50 per packet for non-members.

Volume II, Publication No. 56-14, includes 12 plan sheets for constructing or assembling additional items such as All Purpose Brooder, Indoor Greenhouse, Trouble Lamp, Extension Cord Holder, Lights for Work, Battery Charger, and Water Warmer. Price $1.25 for EEI members, $2.00 per packet for non-members.

* Indicates items that are in FEC Library and which may either be reviewed there or borrowed free by FEC members.

Movie Films

361. ADEQUATE WIRING, S, PS, 16 mm., B/W, sound, 14 1/2 minutes, 1958, Department of Agricultural Engineering, Michigan State University, East Lansing, Michigan 48823.

This film describes the important features of an adequate electrical wiring system that will provide a home with heat, light, and power. It describes losses incurred through inadequate wiring.

362. AUTOMATIC CONTROLS, S, PS, 16 mm., B/W, sound, 14 1/2 minutes, 1958, $65.00, rental $1.00, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

This gives information helpful when planning for adequate wiring and control circuits. Automatic controls such as humidistats, thermostats, limit switches, float switches, pressure switches, motor relays, and time switches are shown.

363. MECHANICAL POULTRY EQUIPMENT, S, PS, 16 mm., B/W, sound, 14 1/2 minutes, 1958, $65.00, free loan, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

Modern equipment for a house, such as mechanical feeders, automatic waterers, mechanical ventilators, mechanical cleaners, and egg gatherers, are described. The interview with an engineer by a poultry scientist, who discusses construction of poultry houses, moisture control, cost of a house, and equipment, will help with wiring and facility layout work.

364. HOG FEEDING, S, PS, 16 mm., B/W, sound, 1960, 14 1/2 minutes, $65.00, rental $1.00, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

The film can be used for wiring and facility planning as it shows equipment for confinement housing on a modern hog farm. Feed handling equipment, waterers, cooling system, ventilation, mechanical cleaners, and lagoon system of manure disposal are described.

365. MATERIALS HANDLING FOR A BEEF LAYOUT, S, PS, 16 mm., B/W, sound, 14 1/2 minutes, 1959, $65.00, rental $1.00, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

Equipment for handling silage, supplement, water, hay, bedding, and manure is shown for a cattle ranch. A farmer explains farmstead layout, auger feeding of beef cattle and other management practices. Materials handling information will help when planning wiring and controls for a beef farm.

366. MATERIALS HANDLING FOR A DAIRY LAYOUT, S, PS, 16 mm., B/W, sound, 14 1/2 minutes, 1959, $65.00, rental $1.00, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

(More information on this item on next page)

Shown and discussed on a modern dairy farm are layout of facilities, sanitation requirements, systems layout, equipment, and management.

367. THE WONDER-FILLED AGE OF ELECTRICITY, P, S, PS, 16 mm., color, sound, 20 minutes, $100.00, National Electrical Manufacturers Association, 155 East 44th Street, New York, N.Y. 10017.

The wonders of the electrical age are told through the eyes of an eight year old to whom electricity represents the most marvelous thing that ever happened. The entertaining and informative story has appeal for old as well as young. The film may be borrowed from NEMA or from Sterling Movies in principal cities.

368. ELECTRICITY AT WORK, Teaching Series, S, PS, 16 mm., color, sound, 15 minutes, 1964, $150.00 each, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

These ten teaching films were produced by the University in cooperation with the Michigan Committee on Rural Electrification. For loan arrangements and prices contact T. C. Surbrook. The ten films, each 15 minutes, are as follows:

1. PUTTING ELECTRONS TO WORK--Electricity is a property of the basic particles of all matter. Positive and negative charges, and reaction between these charges are discussed. Other subjects are: structure of atoms, free electrons and their movement, electric current and making use of it, conductors, insulators, and resistance.

2. UNDERSTANDING VOLTS, AMPERES, AND OHMS--The atom, free electrons-electron movement, the dry cell as a force to cause electron flow, fundamental parts of the electric current, electromotive force, using the voltmeter. Other topics are: electron flow, current, ampere and ammeter, electric load, resistance, the ohm and ohmeter, relationship between volts, amperes, and ohms, and Ohm's Law.

3. USING OHM'S LAW TO UNDERSTAND CIRCUITS--This film covers the three fundamental parts of an electric circuit and applies Ohm's Law. The relationship between voltage, current, and resistance in both series and parallel circuits are shown.

4. WATTS, WATTHOURS, WATTHOUR METERS--It is a discussion of work, power and energy; units of mechanical and electrical power; how to measure power and energy in an electric circuit; how we buy electric power; and how a watthour meter is used to determine wattage of electrical equipment.

5. MECHANICAL GENERATION OF ELECTRICITY--It shows principles of the mechanical generator based on relationships between electricity and magnetism, the magnetic field about a conductor carrying a current, voltage induced in a conductor cutting a magnetic field, alternating voltage and current, single phase, three phase, and voltage and current output of a generator.

6. HOW TRANSFORMERS WORK--The principle of the voltage transformer is based on fundamental relationships between electricity and magnetism which are explained and illustrated. Also discussed are voltage output of a transformer; step up, step down transformers ers; relationship between power in and power out; and obtaining 120/240 volts from a transformer.

7. THE 120/240 VOLT 3-WIRE SYSTEM--or the distribution of electric energy. It describes transformers, tells how to develop a 120/240 volt 3-wire system, gives the reason for neutral and for grounding, and explains the service entrance switch.

8. UNDERSTANDING BRANCH CIRCUITS--Topics are the 120/240 volt 3-wire system, the transformer, service entrance, branch circuits, fusing, National Electric Code, and grounding appliances. Types of conductors and types of branch circuits are classified, and wiring material and practices are discussed.

9. UNDERSTANDING COMMON INDUCTION MOTORS--After discussion of the importance of electric motors, an explanation and demonstration is given of how induction motors operate. It covers the fundamental parts of induction motors, r.p.m. of a motor, and classification of single phase induction-run motors.

10. STARTING CHARACTERISTICS OF COMMON INDUCTION MOTORS--It shows the main parts of an induction motor, how it operates, rpm, classification according to method of starting, split phase start, capacitor start, repulsion start, connecting motors to lines, dual voltage motors, reversing direction of rotation, measurement of starting torque and current, and makes comparison of the starting characteristics of common single phase induction motors.

369. FARM BETTER ELECTRICALLY, S, PS, 16 mm., color, sound, 27 minutes, $275.00 to EEI members, Sales Division, Edison Electric Institute, 750 Third Avenue, New York, N. Y. 10017.

This film shows up-to-date applications of electricity on actual farms. Information is given on dairy operations; poultry, hog, and beef feeding; freezing and packaging; greenhouses; irrigation; materials handling; farm youth work; experimental installations on research farms; and what is the future of agriculture.

370. *FARM MECHANIZATION ELECTRICALLY, S, PS, sound, color, 15 minutes, $120.00, University Film Center, Iowa State University, Ames, Iowa 50010.

This film depicts many phases of farm mechanization, and does a good job of emphasizing the importance of good electrical wiring.

371. PRINCIPLES OF ELECTRICITY, revised and updated, S, PS, 16 mm., color, sound, 20 minutes, $150.00, General Electric Educational Films, 60 Washington Avenue, Schenectady, N. Y. 12305.

This film describes the basic concepts of electrons and electron flow, positive and negative charges, current, voltage, resistance, and fundamental methods of generating electricity. It is a very good film for teaching fundamentals.

372. A IS FOR ATOM, S, PS, 16 mm., color, sound, 15 1/2 minutes, $120.00, General Electric Educational Films, 60 Washington Avenue, Schenectady, N. Y. 12305.

This new revised film describes the nature and properties of the atom, and reflects man's increasing mastery of nuclear technology. It shows today's application of the power of the atom as a servant of mankind.

373. ELECTRICAL SAFETY IN THE HOME, P, S, PS, 16 mm., color, sound, 14 minutes, $140.00, Stout State University, Menomonie, Wis. 54751.

The object of this film is to alert viewers to common electrical hazards that may exist in homes, and to depict proper means of preventing and correcting such hazards. An inspection sheet is used, and a home is inspected. A teacher's guide and a copy of the inspection sheet may be obtained from the Audio-Visual Center, Stout State University.

374. MY POP'S A LINEMAN, P, S, PS, 16 mm., color, sound, 16 minutes, $135.00, Audio-Visual Center, Stout State University, Menomonie, Wis. 54751.

The main points of the story are dramatized by flash-backs to portions of famous high voltage demonstrations which present various situations. A typical workday for a lineman, where several dangerous situations are experienced, is shown. Main points such as kite strings in high tension wires, trees and branches that can conduct electricity, shooting at insulators, and what to do when a high voltage line comes in contact with a car are illustrated.

375. ELECTRIC CIRCUITS, P, S, 16 mm., sound, 13 minutes, 1956, B/W code-653033, $60.00, Text-Film Department, McGraw-Hill Book Company, 330 West 42nd Street, N. Y. 10036. A Teacher's Guide is available.

It illustrates what the elements of an electric circuit are. What is resistance, current, and voltage? It shows how to make a resistance tester, why an electric toaster works, how to light a match with electricity, and how fuses protect our homes.

376. OUR WORLD OF ELECTRICITY, series of five films, P, S, 16 mm., sound, color, each 12 minutes and $120.00; B/W $60.00, rental 10% of list price, 1964, Cenco Educational Films, 1700 Irving Park Road, Chicago, Ill. 60613. A teacher's guide accompanies each film.

1. SERIES AND PARALLEL CIRCUITS, B/W No. 58884; Color No. 58885.

This film utilizes a story situation of a boy and his father working on an electric train at home. Dialogue between the two conveys difficulty the boy experiences in wiring the train properly. The film deals with the concepts of circuits, current flow, series and parallel circuits, and fuses. These concepts are applied to circuits in the home and then to correct wiring of the train set.

2. STATIC ELECTRICITY, B/W No. 58886; Color No. 58887.

A boy and girl notice unusual phenomena, such as hair that stands out on dry days, plastic bags clinging to clothing, and receiving electric shock after shuffling across a carpet. Animated artwork explains the laws and principles of positive and negative charges. Terms such as "electrostatic charge" and "induction" are explained and applied.

3. CURRENT ELECTRICITY, B/W No. 58888; Color No. 58889.

This film defines "static" and "current" electricity and illustrates both with the use of familiar scenes of everyday activities. The concept of electric pressure, a source, and circuit is developed. Uses of current electricity and control with a switch are then illustrated. The concept of good and poor conductors, types of materials, and their use is explained with animated artwork. Resistance, short circuits, and fuses are discussed in the final portion of the film.

4. SOURCES OF ELECTRICITY, B/W No. 58890; Color No. 58891.

Batteries, as a chemical source of electricity existing in a number of types, are illustrated, and their operation is explained. The relationship of direct current is established. Alternating current is explained and related to generators as a mechanical source of electricity. Examples and illustrated applications are presented throughout, associating electricity with familiar activities.

5. RADIO AND RADAR, B/W No. 58892; Color No. 58893.

Wireless communication, although fairly recent, plays a vital part in our lives and in our national defense. This film shows how radio waves are produced, and describes their relationship with other electromagnetic waves. Illustration is given of how radio waves travel, differences between AM and FM radio, and the operation of radar in locating and tracking objects in the air.

378. MATTER AND ENERGY (ELECTRICITY) series of three films, P, 16 mm., sound, Encyclopaedia Britannica Educational Corporation, 425 N. Michigan Avenue, Chicago, Ill. 60611. A Teacher's Guide is included.

1. ELECTROMAGNETS: How They Work, 11 minutes, Color No. 1784 at $120.00; B/W No. 1785 at $60.00.

The film demonstrates that an electromagnetic field is created by the flow of electricity through a conductor, and shows how a simple electromagnet can be constructed. It explains that electromagnets have technological advantages over permanent magnets, that they can be turned on and off, and that they can be strengthened by using a core, extra coils, or more current. Indication is given that there is a relationship between electricity and magnetism.

2. LEARNING ABOUT ELECTRIC CURRENT, 8 minutes, B/W No. 906, $45.00.

(More on this item on next page)

This film describes the characteristics, uses, and dangers of electric current. Circuits, conductors, insulators, fuses, and switches are explained both in animation and in simple demonstrations, and the electricity used in the home is traced back to the generators in a power plant.

3. MAKING ELECTRICITY, 11 minutes, B/W No. 422, $60.00.

This demonstrates how electricity is made by moving a coil of wire through the field of a magnet; explains how a small, hand-powered generator is constructed and how it operates; and then illustrates the same principle applied in generating electricity at a large hydro-electric plant. It shows how electricity is carried over power lines to the consumer.

379. ELECTRICITY AND MAGNETISM, series of five films, S, 16 mm., Encyclopaedia Britannica Educational Corporation, 425 North Michigan Avenue, Chicago, Ill. 60611. A teacher's guide is included.

1. ELEMENTS OF ELECTRICAL CIRCUITS, 11 minutes, B/W No. 214, $60.00.

This film clarifies through demonstrations the concept that electric current is a flow of electrons controlled by circuits. It develops the concept by describing home electrical circuits and by illustrating a short circuit caused by faulty insulation. It reveals functions of conductors and insulators, and makes measurements of electric flow by application of Ohm's law.

2. THE PRIMARY CELL, 11 minutes, B/W No. 247, $60.00.

This describes the construction, characteristics, operation, and utilization of primary electric cells. It demonstrates that electricity is a form of energy which may be derived from a form of chemical energy, and that energy can be conveniently transmitted as a flow of electrons. It also shows that electricity from primary cells can be converted to light, heat, and mechanical energy.

3. SERIES AND PARALLEL CIRCUITS, 11 minutes, B/W No. 259, $60.00.

This clarifies the relationships between resistance, current, and electromotive force in series circuits and in parallel circuits. It illustrates these relationships by computing resistance of a toaster and a lamp, and amperage of a soldering iron. It demonstrates the advantages and disadvantages of both types of circuits. It describes a simple series-parallel combination, and offers appropriate examples.

4. VACUUM TUBES, 11 minutes, B/W No. 216 $60.00.

This explains entirely by animated drawings the operation of a radio vacuum tube in terms of its filament, plate, and grid circuits. It illustrates the three functions of the vacuum tube in a radio: how it serves as an amplifier to operate the loud speaker, as a rectifier in detection, and as an oscillator to generate the carrier wave.

5. WHAT IS ELECTRICITY?, 13 minutes, B/W No. 765, $75.00.

(More on this item on next page)

What Is Electricity? provides a background for studying the nature of electricity. It presents classical electrostatic experiments and electromagnetic experiments of Oersted and Faraday. It explains through diagrams the organization of atoms.

380. ELECTRICITY--DISTRIBUTION, S, PS, 16 mm., color, sound, 16 minutes, FSC-640, rental $5.65, sale $150.00, Audio-Visual Center, Indiana University, Bloomington, Ind. 47401.

The presentation develops basic concepts of electrical distribution, both cross-country and within the home. Complete distribution system is explained, with demonstrations of "line loss" and the use of fuses for overload protection. It reviews parallel and series circuitry, and summarizes, using questions.

381. ELECTRICITY--MEASUREMENT, S, PS, 16 mm., color or B/W, sound, 12 minutes. Color, FSC-645, rental $3.40, sale $100.00; B/W, FS-645, rental $2.15, sale $50.00, Audio-Visual Center, Indiana University, Bloomington, Ind. 47401.

This utilizes simple mock-ups to develop concepts of electrical pressure, current resistance, Ohm's Law and electrical power. Measurement is demonstrated with a battery and lamp circuit. Ohm's Law is used to work the formula: Volts = Amperes x Ohms. Use of the kilowatt-hour meter as a recorder of electrical power is demonstrated.

382. ELECTRICITY--STATIC ELECTRICITY, P, S, 16 mm., color or B/W, sound, 11 minutes. Color, FSC-1049, rental $3.40, sale $100.00; B/W, FS-1049, rental $2.15, sale $50.00, Audio Visual Center, Indiana University, Bloomington, Ind. 47401.

This traces the development of man's understanding of static electricity and shows various ways it is used. It reviews basic laws of electrical charges, develops an explanation of lightning and how it can be controlled, depicts harmful effects of static electricity, and illustrates useful applications.

383. ELECTRICITY--PRODUCTION, S, PS, 16 mm., color or B/W, sound, 15 minutes. Color, FSC-1050, rental $5.65, sale $150.00; B/W, FS-1050, rental $3.90, sale $75.00, Audio-Visual Center, Indiana University, Bloomington, Ind. 47401.

This develops the concept of energy conservation in explaining the basic principles of the generator, storage cell, and primary cell. It shows applications of less well known sources of electrical energy such as photo cells, solar cells, thermocouples, and fuel cells.

384. ELECTRICITY--FROM POWER PLANT TO HOME, P, S, 16 mm., color or B/W, sound, 12 minutes. Color code-402070, sale $140.00; B/W code-402069, $70.00, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

A filmed visit to a power plant serves to acquaint the student with the basic facts regarding the generation and distribution of electric power for home use. Animated drawings are used to explain the process of magnetic induction.

385. ELECTROMAGNETS, P, S, 16 mm., color or B/W, sound, 11 minutes. Color code-401842, sale $125.00; B/W code-401839, sale $65.00, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

It explains the theory of electromagnetism by means of simple equipment and demonstrations, and shows how the electromagnet is used in the doorbell, the telegraph, and many other everyday applications.

386. THE FLOW OF ELECTRICITY, P, S, 16 mm., color or B/W, 11 minutes. Color code-401471, sale $125.00; B/W, code-401470, $60.00, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

This film explains the factors that affect the flow of electricity through a simple electric circuit, introduces the electron theory, and shows the operation of a simple electric circuit in a home situation.

387. BASIC ELECTRICITY & MAGNETISM, series of 15 films, P, S, PS, Standard 8 mm., single-concept films for use in Technicolor Instant Movie Projector, B/W, each 2 to 3 minutes, write for prices, Communications Films, Inc. 870 Monterey Pass Road, Monterey Park, Cal. 91754.

1. What Is Electricity (Static)
2. Electricity And Different Materials
3. Electricity (Static) By Induction & Conduction
4. What Is Magnetism
5. Magnetic Fields, Part I
6. Magnetic Fields, Part II
7. Electric Current and Its Magnetic Field
8. Voltaic Cells
9. Constant Voltage-Depolarization
10. Lead-Acid Storage Battery
11. Voltaic Cells in Series and Parallel
12. Resistance
13. Ohm's Law
14. Resistors in Series and Parallel
15. Magnetism Produces Electricity

386. JUST PLUG IT IN, S, PS, 16 mm., color, sound, 23 1/2 minutes, $200.00, Bay State Film Productions, Box 129, Springfield, Mass. 01100.

This film effectively presents the case for adequate wiring in the home, with narration by Harold Peary, radio and TV actor.

B/W means that the movie films or filmstrips are available in black and white, rather than color.

Filmstrips

401. *FARM ELECTRIC MOTORS, SELECTION, PROTECTION, AND DRIVES, S, PS, 35 mm., 68 single frames, color, 1964, $5.50, American Association for Agricultural Engineering and Vocational Agriculture, Coordinators Office, Agricultural Engineering Building, Athens, Ga. 30601.

The illustrations in this filmstrip are from the publication of the same name, Item No. 557, available from the same source. The discussion deals with single-phase motors, capacities, uses, protection, and connecting.

402. *HOW FARM ELECTRIC MOTORS START AND RUN, S, PS, 35 mm., 86 single frames, color, 1964, set $11.00 postpaid, American Association for Agricultural Engineering and Vocational Agriculture, Coordinators Office, Ag. Engineering Bldg., Athens, Ga. 30601.

This gives a very simple presentation dealing with the starting and running principles for different types of single phase motors commonly used on farms. No previous understanding of electricity or magnetism is needed to understand this film. Script is on the film. It was granted a blue ribbon award by ASAE.

403. *ELECTRICAL TERMS--THEIR MEANING AND USE, P, S, 35 mm., 89 single frames, color, set $11.00 postpaid, American Association for Agricultural Engineering and Vocational Agriculture, Coordinators Office, Ag. Engineering Bldg., Athens, Ga. 30601.

The visuals are from the publication of the same name, Item No. 501, available from the same source. The script is on the film. The discussion deals with terms, practical illustrations, and how electrical energy is purchased. The information is prepared for those who know little or nothing about electricity.

404. UNDERSTANDING ELECTRICITY, P, S, 1967, Society for Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614.

Photographs, diagrams, and recorded narration explain and illustrate basic principles of electricity, explore sources, and explain application of this force to modern equipment. Terms related to electricity are emphasized.

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|---|---|
| Each filmstrip with teacher's guide | $6.00 |
| Record for filmstrip 412-1 and 412-2 | 3.00 |
| Record for filmstrip 412-3 and 412-4 | 3.00 |
| 412-SR Set of 4 filmstrips, 2 back-to-back 33 1/3 rpm records and guides | $27.00 |

412-1. HOW RADIO AND RADAR WORK, 59 frames, 14 minutes. This tells how radio waves are produced and how they travel, shows function of transmitter and receiver, and explains radar.

412-2. HOW ELECTRICITY IS PRODUCED, 61 frames, 14 minutes. It shows how generators and batteries differ; also, shows producing electricity by piezoelectric, photoelectric, and thermoelectric effects.

(More on Item 404 on next page)

412-3. PRODUCING STATIC ELECTRICITY, 59 frames, 13 min.
This shows how materials become positively or negatively charged, and explains why electrically charged objects repel or attract.

412-4. ELECTRIC CIRCUITS AND HOW THEY WORK, 58 frames, 6 to 12 1/2 minutes.
It explains steps necessary to form a circuit. It shows difference in parallel and series circuits, and tells why a fuse blows.

405. *ELECTRIC CIRCUITS, S, 57 frames, color, 1966, catalog No. 482-6, $6.00, Society for Visual Education, 1345 Diversey Avenue, Chicago, Ill. 60614.

Circuits in general are described; also, series, parallel, and series-parallel circuits. Ohm's law of resistance is explained, and terms are defined.

406. *THE PRINCIPLES OF ELECTRIC MOTORS AND GENERATORS, S, 68 frames, color, 1966, $6.00, catalog No. 482-7, filmstrip with captions, Society for Visual Education, 1345 Diversey Avenue, Chicago, Ill. 60614.

In this filmstrip with captions, laws of electro-magnetism are discussed. AC and DC motors and generators are included, and also questions.

407. LEARNING ARC WELDING SKILLS, Process, Equipment, Safety, Flat Position, Vertical, and Overhead, S, PS, set of three with 43, 61, 32 frames, respectively, set only $5.00 postpaid, James F. Lincoln Arc Welding Foundation, P. O. Box 3035, Cleveland, O.

Three full-color filmstrips introduce the arc welding process, equipment, safety, and skills. They were prepared in cooperation with the Vo-Ag Service of the University of Illinois for teaching in vocational agriculture, industrial arts, and trade and industry.

408. DIAGRAMMING ELECTRICAL WIRING CIRCUITS (401-65), S, PS, 54 frames, B/W, single-frame slidefilm, Code No. 2007a, $1.11 plus postage, Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Ill. 61801.

This slidefilm discusses planning electrical circuits, diagramming the circuits, and the use of standard symbols. Standard symbols make neater diagrams that are easier to check. Simple rules for wiring in cable and conduit are given.

409. UNPACKING, CHECKING AND IDENTIFYING ELECTRICAL ITEMS (404-64), S, PS, 68 single-frame slidefilm, B/W, Code No. 2010a, $1.21 plus postage, Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Ill. 61801.

This slidefilm is useful when unpacking and checking items contained in received shipments. It is also helpful in teaching identification of commonly used electrical items. It was prepared for use with the Illinois Vo-Ag Service Electrical Loan Box.

410. ELECTRIC WELDING, LEARNING AND APPLICATION, S, PS, single frame slidefilms, Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Ill. 61801.

LEARNING ARC WELDING SKILLS I (450-64) 45 frames, color
LEARNING ARC WELDING SKILLS II (451-64) 63 frames, color
LEARNING ARC WELDING SKILLS III (452-64) 34 frames, color
Code No. 2043a, set of three, $5.00 plus postage

The first film describes the equipment used in arc welding and safety precautions to follow. The second film tells how to strike and hold the arc, run beads, and how to make downhand, fillet, lap, and corner welds. The third film tells how to make out-of-position welds.

WELDING CAST IRON WITH ARC WELDER (457) 47 frames, B/W, Code No. 2050, $0.65 f.o.b. Urbana, Ill.

Three types of cast iron are discussed and the spark test for identifying the metal is explained. A detailed procedure for preparing the metal is illustrated. Complete instructions are given for the actual welding process. Information is provided to prevent cracking, overheating, etc., to solve typical problems in welding cast iron.

HARDSURFACING FARM EQUIPMENT WITH THE ARC WELDER (458) 36 frames, B/W, Code No. 2051, $0.53 f.o.b. Urbana.

The important differences between abrasion and impact are explained as they relate to agricultural and soil tillage tools. The work hardening features of certain materials are explained and the use of chromium carbide material on soil tillage tools is illustrated. The use of powder with the carbon arc torch on thin tools and electrodes on thicker tools is explained in detail.

HEATING, BRAZING, SOLDERING AND CUTTING WITH ARC WELDING EQUIPMENT (459) 39 frames, B/W, Code No. 2052, $0.56 f.o.b. Urbana, Ill.

Illustrations and instructions are given for operating the carbon arc torch for heating and bending. Brazing can be done with either the carbon torch or one carbon and the electrode holder. Soldering can be done with with one carbon, with carbon arc torch or soldering irons can be heated with the torch. Cutting metal and piercing hole with mild steel electrode is illustrated.

411. DC AND AC MOTOR THEORY, TESTING, CONNECTING, AND TROUBLE SHOOTING, S, PS, four single frame B/W slidefilms, set of 4 films $2.10 f.o.b. Urbana, Vocational Agriculture Service, 434 Mumford Hall, University of Illinois, Urbana, Ill. 61801.

MAGNETISM AND THE DC MOTOR (Part 1) 31 frames, Code No. 2015, $0.44 f.o.b. Urbana, Ill.

The subject of magnetism, its uses and principles are presented. Several shop demonstrations of applications of magnetism and electricity are illustrated. The operating principles of the DC motor are explained.

INDUCTION AND THE AC MOTOR (Part 2) 33 frames, Code No. 2016, $0.44 f.o.b. Urbana, Ill.

Alternating current is first introduced and explained. The AC electromagnet "growler" is explained. Schematic drawings are used to illustrate how the AC motor runs by induced current. The starting winding and starting switches used in the split-phase, capacitor and repulsion-induction motor are illustrated. There is also a discussion of the universal motor.

TESTING AND IDENTIFYING LEADS, CONNECTING AND REVERSING (Part 3) 36 frames, Code No. 2017, $0.53 f.o.b. Urbana, Ill.

An explanation of the makeup of an AC and a DC Test Set is given. This includes the use of the DC voltmeter and the AC voltmeter and ammeter. The identification of the leads extending from the motor windings is explained by using the two test sets. The identifications are explained for the split phase, capacitor and repulsion-induction motors. The procedure for reversing each of these motors is explained.

TROUBLE SHOOTING (Part 4) 61 frames, Code No. 2018, $0.84 f.o.b. Urbana, Ill.

Troubles with electric motors are divided into three categories: completely dead, hums but will not start, and runs unevenly or heats excessively. A systematic analysis procedure is outlined to locate motor troubles that have the above listed symptoms.

412. BASIC ELECTRICITY, P, S, 12 filmstrips, average length 69 frames, Series No. 2270, complete series $52.60, individually $4.95, The Jam Handy Organization, 2821 E. Grand Boulevard, Detroit, Mich. 48211.

This series of twelve filmstrips presents: Magnetism, Static Electricity, Current Electricity, The Electric Cell, The Storage Battery, Electromagnetism, The Generator, Alternating Current, Electric Motors (2), and Applications (2). The drawings, photographs, and diagrams are accompanied by explanatory text. Pictures provide visual patterns one at a time and proceed in logical sequence from the simple to the complex.

413. UNDERSTANDING ELECTRICITY, S, 7 filmstrips, color, average length 35 frames, Series No. 1210, complete series $38.30, individually $5.95, The Jam Handy Organization, 2821 East Grand Boulevard, Detroit, Mich. 48211.

This series of seven color filmstrips introduces electricity--explains what it is, what it does, and how it works for us in the home, including safety tips.

Slides, and Overhead Projector Transparencies

451. *THE ELECTRIFICATION FARM STORY, series of six slide sets, S, PS, color, 2 x 2 slides, 1965, Edison Electric Institute, 750 Third Avenue, New York, N. Y. 10017.

The farm story is presented in a series of six subjects: dairy, beef, swine, materials handling, poultry, and miscellaneous applications. Each set is in a vinyl binder with slide holders inserted and caption sheets explaining each slide.

452. FUNDAMENTALS OF ELECTRICITY, Michigan State University, Michigan Committee on Rural Electrification cooperating, S, PS, four sets, 1965, Department of Agricultural Engineering, Michigan State University, East Lansing, Mich. 48823.

All four sets are designed as a teaching aid for 4-H leaders, vocational agriculture teachers, extension personnel, and electric power suppliers.

1. PUTTING ELECTRONS TO WORK, S, PS, 19 color 2 x 2 slides and script, $5.00.
The basic principles of electricity are illustrated. The slides begin with an examination of the atom and the origin of electrical charges. They describe amperage, voltage, and resistance, and the proper method of measuring each.

2. MECHANICAL GENERATION OF ELECTRIC POWER, S, PS, 34 color 2 x 2 slides and script, $8.75.
These illustrate how an alternating current is generated. Single and three phase power are briefly discussed.

3. HOW A TRANSFORMER WORKS, S, PS, 16 color 2 x 2 slides and script, $4.25.
The purpose of transformers and the principle upon which they operate are illustrated. The slides illustrate the magnetic field, the effect of an iron core, and the relation between input and output voltages of the transformer.

4. COMMON INDUCTION MOTORS: TYPES AND THEIR DIFFERENCES, S, PS, 26 color 2 x 2 slides and script, $7.00.
The differences in the four common types of single phase induction motors and the importance of these differences are illustrated. Design and operating details are shown.

453. ELECTRICITY FOR HOME USE, S, PS, 31 color slides, 2 x 2, $3.50 per set, Cooperative Extension Service, North Dakota State University, Fargo, North Dakota 58102.

The slide set and script presents the need for adequate farm wiring, and what is involved in planning and having an adequate wiring installation.

454. MILK HOUSE SCORE CARD, S, PS, 34 slides, 2 x 2, and script, $5.50 per set, Frank Anthony, Department of Agricultural Education, 101 Agricultural Education Building, Pennsylvania State University, University Park, Pa. 16802.

(More on this item on next page)

This slide set gives a good vocational agriculture field exercise teaching example in full detail. Complete information for a milkhouse is given, and the score card is to be completed by the students.

455. *WHAT IS YOUR C-A-S-E WITH ELECTRICITY?, S, PS, 44 color slides, 2 x 2, and script, $6.50 per set, Frank Anthony, Department of Education, 101 Agricultural Education Building, The Pennsylvania State University, University Park, Pa. 16802.

This presentation discusses convenience, adequacy, safety, and efficiency in the use of electricity. A score card is used by the students. A pack of fifty score cards costs $1.00.

456. ELECTRICITY SERIES, TRANSPARENCIES FOR THE OVERHEAD PROJECTOR, S, PS, available from branch Keuffel & Esser Co. dealers, or Keuffel & Esser Company, Educational/Audio-visual Division, Adams and Third Streets, Hoboken, N. J. 07030.

| | | Overlays | Cost |
|---|---|---|---|
| No. 30 6105-67 | COULOMB'S TORSION BALANCE | 2 | $3.55 |
| No. 30 6105-68 | OIL DROP EXPERIMENT | 2 | 3.55 |
| No. 30 6105-69 | WHEATSTONE BRIDGE | 3 | 4.45 |
| No. 30 6105-70 | THE EARTH AS A MAGNET | 3 | 4.45 |
| No. 30 6105-71 | MAGNETIC POLARITY OF A COIL | 3 | 4.45 |
| No. 30 6105-72 | ELECTRIC METERS | 3 | 4.45 |
| No. 30 6105-73 | SELF INDUCTION | 3 | 4.45 |
| No. 30 6105-74 | THE INDUCTION COIL | 2 | 3.55 |
| No. 30 6105-75 | THE AC GENERATOR | 6 | 7.25 |
| No. 30 6105-76 | DC GENERATOR & DC MOTOR | 6 | 7.25 |
| No. 30 6105-77 | THE TRANSFORMER | 2 | 3.55 |

Overlays provide a step-by-step build-up of each problem. The instructor can proceed at a pace best suited for the class, and by use of overlays can simplify the more complex problems for easier understanding by the students.

457. HOW ELECTRICITY PERFORMS, S, PS, 6 sets 2 x 2 color slides, each with a script. Order from MATVA, 340 Erickson Hall, Michigan State University, East Lansing, Mich. 48823. For information, write to T. C. Surbrook, Agricultural Engineering Department, Michigan State University, East Lansing, Mich. 48823.

1. PUTTING ELECTRONS TO WORK, 19 colored slides, $7.00.
Principles of electricity, such as the atom, its electrons, effects of opposite and like charges, electron movement, electric current, electromotive force, and instruments for measuring amperes, volts, and ohms, are discussed.

2. MECHANICAL GENERATION OF POWER, 34 colored slides, $12.00
The generation of alternating current is illustrated. Two fundamental relations between electricity and magnetism are shown to be the basic principles of the mechanical generator. A conductor shaped as a loop is revolved in a magnetic field of a "mock-up" generator to show, step by step, how an alternating voltage is produced. Cycle, frequency, phase, voltage current relationship, and three-phase voltage are explained and illustrated.

(More on item 457 on next page)

3. WHY A VOLTAGE TRANSFORMER WORKS, 17 colored slides and script, $6.00.

The existence of a magnetic field around a current carrying conductor is illustrated and discussed, including a strong magnetic field, solenoid, transformer design, induced voltage, and windings.

4. SINGLE PHASE INDUCTION MOTORS: COMMON TYPES AND THEIR DIFFERENCES, 17 slides, mostly colored, $10.00.

Discussed and illustrated are the parts of the induction motor, why it is called an induction motor, the four common single-phase types, how they start and run, reversing direction, and dual voltage motor.

5. CONNECTING AND REVERSING COMMON ELECTRIC MOTORS, 30 colored slides, $11.00.

This set illustrated the simplicity of single phase induction run motors, what makes them run, and auxiliary starting devices; also, how to use motor name plate information to construct schematic drawings of motor circuits, how to trace motor circuits, how to connect motors to the line, and how to reverse them.

6. WHY OUR ELECTRIC WIRING IS SAFE, 31 non-technical colored slides, $11.00.

These slides illustrate how electric wiring systems, from the transformer to the outlets in a building, are designed to be safe. Why and how our wiring systems are grounded is fully illustrated.

458. *WIRING FOR YOUR HOME, S, PS, 42 slides, 2 x 2, and script, $5.50, Division of Photography, Office of Information, USDA, Washington, D. C. 20250.

The slides show the importance of adequate wiring, fusing, and circuits within the home. Fundamental electrical terms are explained. This set is one of a series prepared by the Housing section of the Southern Region Plan Exchange Committee with the Federal Extension Service.

459. MAGNETISM AND ELECTRICITY, overhead transparencies, S, PS, color, each with lesson plan, set of 12 or individually, Beckley-Cardy, 1900 N. Narragansett Avenue, Chicago, Ill. 60639.

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|---|---|---|
| ME-1 | LAWS OF MAGNETISM | $4.75 |
| ME-2 | EARTH'S MAGNETIC FIELD | 3.95 |
| ME-3 | COMPASS | 3.95 |
| ME-4 | ELECTROSCOPE | 4.75 |
| ME-5 | BATTERIES | 3.95 |
| ME-6 | CIRCUITS | 4.75 |
| ME-7 | GENERATING STATION | 4.75 |
| ME-8 | ELECTRIC MOTOR | 3.95 |
| ME-9 | ELECTRIC BELL | 3.95 |
| ME-10 | TELEGRAPH | 3.95 |
| ME-11 | TELEPHONE | 3.95 |
| ME-12 | TELEVISION | 3.95 |
| No. EME-1620, complete set of 12 | | 48.00 |

460. ENERGY, overhead transparencies, P, S, color, each with teaching guide with suggestions for presentation and use, Instructo Products Company, 1635 North 55th Street, Philadelphia, Pa. 19131.

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| No. 824-1 | FIELDS OF FORCE, 5 overlays | $4.95 |
| No. 824-2 | DRY CELL & CIRCUIT, 3 overlays, 3 masks | 3.95 |
| No. 824-3 | ELECTRIC BELL, 1 overlay | 2.95 |
| No. 824-A | Complete series of three above | 10.95 |

## Texts and Booklets

501. *ELECTRICAL TERMS, Their Meaning and Use, S, PS, 8 1/2 x 11 printed, 36 pp., 1962, $0.85 per copy, $0.75 each for 10 or more, American Association for Agricultural Engineering and Vocational Agriculture, Coordinator's Office, Agricultural Engineering Building, Athens, Ga. 30601.

Electrical terms are explained, then used in practical illustrations to show value in an everyday understanding of electricity. Also discussed are rates and how electrical energy is purchased. Included is a table listing 122 pieces of farm and home electrical equipment, approximate wattage, and kilowatt-hour usage. A filmstrip and script based on this manual is available; see Item 403.

502. *FUNDAMENTALS OF ELECTRICITY AND MAGNETISM, P, S, PS, 8 1/2 x 11 printed, 24 pp., 1956, Delco-Remy Division of General Motors Corporation, Anderson, Ind. 46011.

Covers composition of matter, electrons, magnetism and magnets, electromagnetic fields, combined magnetic and opposing magnetic fields, solenoids, magnetic force on a conductor, electromagnetic induction, Ohm's Law, meter movements. Well illustrated with diagrams.

503. *LIVING WITH ELECTRICITY, P, S, PS, 8 1/2 x 11 printed, 36 pp., 1962, The Dayton Power and Light Company, 25 North Main Street, Dayton, O. 45401.

This booklet is designed primarily for high school students, with a preface for teachers. It covers how electricity is made; uses in the home, in industry, and on the farm; electrical terms; and average wattage of some appliances.

504. *AIDS TO USING ELECTRICITY ON INDIANA FARMS, Harry Leonard, Agricultural Education, and Paul E. Johnson, Agricultural Engineer, S, PS, 8 1/2 x 11 printed, 60 pp., 1962, Agricultural Engineering Department, Purdue University, Lafayette, Ind.

Prepared mainly for use in the state's vo-ag classes in developing an understanding of fundamentals of electricity; common terms and measures; common wiring materials, circuit protection; selecting, operating, and care of farm motors; the farm wiring system; lighting the farmstead; using electric heat on the farm; and controls. Application information is divided into ten units and includes charts.

505. *BASIC ELECTRICITY AND AN INTRODUCTION TO ELECTRONICS, S, PS, 8 1/2 x 11 paper back, 172 pp., 1966, $3.60, Howard W. Sams and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

A fundamental text that progresses from the structure of atoms to basic circuits. Covers direct current, cells and batteries, magnetism, alternating current, electromagnetic induction, measurement and control, distribution, heating, lighting, wire communication, radiations, and electronics.

506. *THE ABC'S OF ELECTRICITY, P, S, 5 1/2 x 8 1/2 paperback, 96 pp., 1963, $4.25, Howard W. Sams and Company, Inc., 4300 West 62nd Street, Indianapolis, Ind. 46206.

This text is a guide to learning basic principles of electricity. It explains the "How's and Why's" in terms everyone can understand.

507. *PRACTICAL SCIENCE PROJECTS IN ELECTRICITY/ELECTRONICS, Edward M. Noll, P, S, PS, 5 x 7, 472 pp., 1966, $4.95, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

This book gives step-by-step construction information for basic electricity and electronics learning demonstrations. Every chapter contains sufficient text material to explain what happens in each demonstration.

508. INTERIOR ELECTRIC WIRING, Part I, Residential, Kennard C. Graham, S, PS, 7 x 10 printed, 311 pp., 1961, American Technical Society, 848 East 68th Street, Chicago, Ill. 60637.

This book gives excellent detail, work layout and tools needed, and is good for special classes. A companion study guide is available, Item 509.

509. STUDY GUIDE FOR INTERIOR ELECTRIC WIRING, Part I, Residential, Robert H. Masterson, S, PS, 7 x 10 printed, 70 pp., 1961, American Technical Society, 848 East 68th Street, Chicago, Ill. 60637.

This guide is based on the textbook "Interior Electric Wiring", Item 508, and gives in detail thirteen assignments, check tests, and examinations. The book gives excellent details, work layouts, and lists tools needed.

510. *ELECTRICIAN'S EXAMINATIONS, Questions and Answers, Edwin P. Anderson, PS, 5 x 7, 280 pp., 1965, $3.50, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

A practical handbook for workers and students preparing for all grades of electrician's license examinations. It is a helpful review of fundamental principles underlying each question and answer.

511. *ELECTRIC SCIENCE DICTIONARY, Frank D. Graham, S, PS, 5 x 7, 1965, $3.50, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

The dictionary is designed as an encyclopedia of electricity, defining over 9,000 words, terms, and phrases, arranged in alphabetical order.

512. *ELECTRICAL POWER CALCULATIONS, with Diagrams, Edwin P. Anderson, S, PS, 5 x 7, 298 illustrations, 488 pp. 1965, $3.95, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

This text is a student and worker mathematical tool. It explains mathematical formulas and fundamental laws for practical problems in electricity and radio calculations. It contains tables on conversion, wire gauges and capacities, symbols, etc.

513. *PROGRAMMED BASIC ELECTRICITY COURSE, Milton Rosenburg, Ph. D., P, S, PS, 5 x 7, 1964, $4.00, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

A home study course on electricity fundamentals, including basic series circuits, Ohm's Law, parallel circuits, voltage, current, resistance, etc. A self-testing study guide consists of ten lessons and 1,000 questions and answers.

514. *INSTRUCTIONAL MATERIALS, FOR TRADE, INDUSTRIAL, AND TECHNICAL OCCUPATIONS, S, PS, 6 x 9, 50 pp., 1967, write for price list of currently available materials, Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University, Columbus, O. 43210.

This describes the many instructional items prepared by this Laboratory. Consists mainly of lesson plans or informative materials for the instructor and assignment sheets for the student. Seventeen items related to electricity were listed in the 1966 price list.

515. *SELECTED REFERENCES AND AIDS USEFUL IN TEACHING AGRICULTURAL MECHANICS, 8 1/2 x 11, 80 pp., 1965, Agricultural Education Division, Rural Education Department, N. Y. State College of Agriculture, Cornell University, Ithaca, N. Y. 14850.

It lists: 15 electrification bulletins and circulars;
9 electrification films, filmstrips, and slides;
8 electrification commercial items;
also, 41 materials handling references;
13 materials handling films, filmstrips, and slides;
and 13 materials handling commercial items.
Also contains welding, agricultural shop, and safety references.

516. FARM ELECTRIFICATION, R. H. Brown, S, PS, 6 x 9, 210 illustrations, 369 pp., 1956, $8.50, McGraw-Hill Book Company, Inc. 330 West 42nd Street, New York, N. Y. 10036.

Stresses applications, safety features, procedures for selecting equipment and supplies, planning and installing wiring systems, modernization and practical utilization of electricity.

517. *ABC'S OF ELECTRIC MOTORS AND GENERATORS, Allan Lytel, S, PS, 5 1/2 x 8 1/2 paperback, 128 pp., 1966, $2.25, Howard W. Sams and Company, Inc., 4300 West 62nd Street, Indianapolis, Ind. 46206.

The book is a basic intoduction to motors and generators, explaining how they operate and the expected performance. Simplified explanations cover both AC and DC motors and generators, types, and applications.

518. *LEARNING ELECTRICITY FUNDAMENTALS, Lennard R. Crow, P (limited), S, PS, 5 1/2 x 8 1/2 paperback, 416 pp., 1966, $5.95, Howard W. Sams and Company, Inc., 4300 West 62nd Street, Indianapolis, Ind. 46206.

Presents fundamentals of electricity in a straight-forward approach. Much of the information can be understood by advanced primary school students. The electric theory is followed by progressive stages of information about DC generation and motors, and AC motors and transformers.

519. *ELECTRICAL TEXTBOOK FOR FARMING AND HOMEMAKING, S, PS, 6 x 9 hard cover, 294 pp., 1965, $3.50, The South Dakota Rural Electric Association, Inc., Box 157, Huron, S. Dak. 57350.

The book deals with sources of electric power, wiring, the development of modern uses of electricity in the home and on the farm, and emphasizes safety.

520. USING ELECTRICITY ON THE FARM, J. Roland Hamilton, S, 6 x 9, 300 illustrations, 421 pp., 1959, list $7.88, net $5.91, Prentice-Hall, Inc., Englewood Cliffs, N. J. 07632.

Six problem units and 14 chapters cover opportunities in electrification, basic electricity, farmstead wiring, electric motors, lighting and water systems, and farm equipment. The text, in simple, clear style, is organized in class-tested problem units.

521. PRACTICAL ELECTRIC WIRING, H. P. Richter, 7th edition, S, PS, 5 1/8 x 8, 473 illustrations, 585 pp., 1967, write for price, McGraw-Hill Book Company, 330 West 42nd St., New York, 10036.

This text is intended for either independent study or for class work, and presupposes no previous knowledge of the subject. It is an instruction manual rather than reference; covers electrical wiring in practical fashion for homes and farms, as well as for industrial and other structures.

522. ALL ABOUT HOUSE WIRING--How To Wire New Buildings and Modernize Old Wiring, Floyd Mix and E. C. Pritchard, S, PS, 6 x 8 3/4, 176 pp., 196 illustrations, 1959, $3.00, Goodheart-Willcox Company, 18250 Harwood Street, Homewood, Ill. 60430.


For electric program materials for:

Vo-ag -- see the Blue section

Vo-tech -- see the Goldenrod section

4-H Clubs -- see the Green section

Visual aids are listed in the Pink section

Textbooks, handbooks, and bulletins are listed in the Yellow section

## Handbooks, Manuals, and Guides

551. *HANDBOOK OF WIRING SPECIFICATIONS, FOR ELECTRICAL FARM EQUIPMENT, R. H. Larson and C. N. Turner, S, PS, 8 1/2 x 11 spiral binder, 97 pp., 1957, Department of Agricultural Engineering, Cornell University, Ithaca, N. Y. 14850.

This manual describes wiring methods that will be of assistance to the electrician or service man engaged in farm wiring. Gives wiring specifications and diagrams for actual installation of electrical equipment on the farm.

552. *FARM WIRING SYSTEMS, S, PS, 8 1/2 x 11 spiral binder, 29 pp., Iowa Southern Utilities Company, 300 Sheridan Avenue, Centerville, Iowa 52544.

This basic guide covers planning for a farm wiring system, interior wiring design of farmstead buildings, explanation of terms, switches, fuses, and circuit breakers, wire sizes, cutting and splicing wires, efficient and safe wiring, laboratory wiring exercises, comparative data on types of motors, and estimated KWH used by various pieces of farm equipment.

553. *FARMSTEAD WIRING HANDBOOK, Industry Committee on Interior Wiring Design, S, PS, 8 1/2 x 11 printed, 73 pp., 1965, 1-5 copies $1.50 each, 6-25 copies $1.00, 26-99 copies $0.60, Edison Electric Institute, 750 Third Avenue, New York 10017, or Farm Electrification Council, Box 1008, Oakbrook, Ill. 60523.

A comprehensive handbook representing the electrical industry's opinion as to the minimum for farmstead wiring systems to provide reasonable adequacy for present and future needs.

554. *SIMPLIFIED ELECTRIC WIRING HANDBOOK, S, PS, 8 1/2 x 11, printed, 55 pp., 1964, $0.50, Sears, Roebuck and Company, local.

Handbook covers wiring principles, planning, grounding, adding new circuits, indoor wiring, connecting switches, tools needed, circuit failures, wiring farms and ranches, outdoor wiring and lighting, basic wiring materials, and new products.

555. *WIRING DIAGRAMS, For Light and Power, Edwin P. Anderson, PS, 5 x 8, 312 pp., 1965, $4.00, Theodore Audel and Company, 4300 West 62nd Street, Indianapolis, Ind. 46206.

A practical handbook of electrical hook-ups. Electric wiremen, construction engineers, contractors, and students will find the diagrams complete and self-explaining.

556. *MAINTAINING THE HOME LIGHTING AND WIRING SYSTEM, S, PS, 8 1/2 x 11 printed, 141 illustrations, 62 pp., 1965, $1.50, 10 or more $1.35 postpaid, American Association for Agricultural Engineering and Vocational Agriculture, Coordinator's Office, Agricultural Engineering Building, University of Georgia, Athens, Ga. 30601.

This do-it-yourself type manual gives a comprehensive treatment of correct and safe procedures for replacing electrical items that are most likely to wear out or give trouble. Quality of materials and operating principles are explained for some items.

557. *FARM ELECTRIC MOTORS, SELECTION, PROTECTION, DRIVES, S, PS, 8 1/2 x 11 printed, 41 illustrations, 36 pp., 1964, American Association for Agricultural Engineering and Vocational Agriculture, Coordinator's Office, Agricultural Engineering Building, University of Georgia, Athens, Ga. 30601.

Includes non-technical information any student or farmer should know about single-phase motors commonly used on farms, their capacities, and limitations, what electrical and mechanical protection to provide, and how to properly connect them to driven machines. Tables are included. A filmstrip and script based on this pamphlet is available, see Items 401 and 402.

558. *INTRODUCTION TO ELECTRIC MOTORS, SELECTION, OPERATION, AND CARE, S, PS, 8 1/2 x 11 ring binder, 43 pp., 1964, inquire about availability, Potomac Edison Company, 55 East Washington Street, Hagerstown, Md. 21740.

The assembled teaching materials are provided to help the student to understand electric motors--their selection, operation, and care. Included are booklets: "Farm Electric Motors" by American Association for Agricultural Engineering and Vocational Agriculture, Item 557; "Protection Handbook based on 1962 Code" by Bussmann Manufacturing Division of McGraw-Edison Co,, Item 560; and "A Guide to Care of Electric Motors" by Allis-Chalmers Manufacturing Company, Item 559.

559. *A GUIDE TO CARE OF ELECTRIC MOTORS, S, PS, 8 1/2 x 11 printed, 16 pp., 1964, Allis-Chalmers Manufacturing Company, Box 512, Milwaukee, Wis. 53201.

Here is a simple and interesting explanation for correction of misalignment "by ear", dust removal, drying out motors, oiling, keeping wear under control, locating vibration source, abused bearings, underloading and overloading of induction motors, which motor ailments are spotted by-sight, by-sound, and by-touch.

560. *PROTECTION HANDBOOK, Based on 1962 Code, S, PS, 8 1/2 x 11, 26 pp., 1964, Bussmann Manufacturing Division of McGraw-Edison Company, University at Jefferson, St. Louis, Mo. 63107.

It contains suggestions to help in selecting protective devices for electric circuits, motors, appliances, and apparatus, and includes a list showing size to use.

561. *ELECTRICAL MACHINERY CATECHISM, PS, 8 1/2 x 11 printed, 47 pp., Fairbanks Morse and Company, Freeport, Ill. 61032.

Presents in a simple way the most important theoretical and practical features of the common types of DC and AC motors, generators, and control equipment. Intended for those not familiar with electrical phenomena or terminology.

562. *ELECTRICAL AND BASIC CONTROLS USED IN AGRICULTURAL PRODUCTION, Suggestions for Teaching, S, PS, 8 1/2 x 11, 60 pp., $4.75 (Members of EEI $4.00), 2-9 copies $3.75, 10 and over $3.00, Edison Electric Institute, 750 Third Avenue, New York, N. Y. 10017.

(More on this item on next page)

This guide is a compilation of materials from various states. Covers controls and basic control circuits for agricultural production machinery. It is in the form of lesson plans, and is accompanied by a set of transparencies ready for overhead projection.

563. *MODERN ELECTRIC CONTROLS, An application Manual, J. F. McPartland, PS, 8 1/2 x 11 printed, 54 pp., 1961, Furnas Electric Company, Batavia, Ill. 60510.

This manual gives ready-reference data on equipment and techniques for control of power, heating, and lighting loads; and covers operation of control equipment, selection of proper sizes and ratings, layout and installation of circuits.

564. *ELECTRICAL MOTOR CONTROLS AND CIRCUITS, J. David Fuchs and Stephen W. Garstang, PS, 5 1/2 x 8 1/2 paperback, 268 pp., 1963, $4.95, Howard W. Sams and Company, Inc., 4300 West 62nd Street, Indianapolis, Ind. 46206.

A comprehensive handbook for designers, installers, and maintenance personnel, covering motor starting, speed reduction, motor reversal, pilot devices, control circuit design, and motor protection. Book is not designed to specifically cover farm applications, but would be valuable to installers and service men working on farm motor applications.

565. *CAMP COUNSELORS' MANUAL FOR TEACHING, Fundamentals of Good Lighting, P, S, 8 1/2 x 11, 20 pp., 1964, The Connecticut Light and Power Company, Farm Service Department, P.O.Box 2010, Hartford, Conn. 06101.

566. ARC WELDING MANUAL, W. A. Sellon and John W. Matthews, S, PS, 8 1/2 x 11, 44 pp., 1966, $0.50 postpaid, James F. Lincoln Arc Welding Foundation, P.O.Box 3035, Cleveland, O. 44117.

This non-technical manual gives simple and direct instruction, includes all necessary data, and is well-illustrated. It is a practical manual for vo-tech and vo-ag teachers, as well as for self instruction.

567. *A STITCH IN TIME, Electrical Insulation Testing Manual, S, PS, 5 x 8, heavy paper, 56 pp., 1966, 2-10 copies $0.50, one copy free, James G. Biddle Company, Township Line & Jolly Roads, Plymouth Meeting, Pa. 19462.

One objective of this handbook is to help the reader understand electrical insulation testing and become familiar with methods and equipment to do the job. Instruction is aided by slides or filmstrip and record.

568. AMERICAN ELECTRICIANS HANDBOOK, Terrell Croft, 8th Edition, S, PS, 5 x 7 1/2, 1485 illustrations, 1705 pp., $18.50, McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 10036.

This wiring and engineering handbook includes complete data on wires and cables, conductor materials, wiring tables, distribution systems, transformers, motors, calculating load on circuits, voltage drop, carrying capacities and care, installation, and selection.

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* Indicates items that are in FEC Library.

569. FUNDAMENTALS OF ELECTRICITY, 5th Edition, Kennard C. Graham, S, 325 illustrations, 342 pp., $4.75, American Technical Society, 848 East 58th Street, Chicago, Ill. 60637.

This book relates electrical fundamentals to modern application. A study guide is available for use with the book, costing $1.50.

570. NATIONAL ELECTRICAL CODE AND BLUEPRINT READING, Kennard C. Graham, S, PS, 8 1/2 x 11 spiral bound, 153 pp., 330 illustrations, $4.90, American Technical Society, 848 East 58th Street, Chicago, Ill. 60637.

Based on 1965 Code, it covers single family and multi-family dwellings, commercial and industrial locations, and special and hazardous locations. Each section has trade competency tests for students, plus three final examination tests. Includes a list of symbols commonly used in blueprints.

571. *THE HOW AND WHY WONDER BOOK OF ELECTRICITY, P, 8 1/4 x 11, 48 pp., 1960, $0.50, Wonder Books, New York.

Gives answers to questions about electricity that are easy for young people to understand. Story of Mike and his sister who explore the wonders of electricity with their father.

572. *ELECTRICITY IN YOUR LIFE, Eugene David, P, 6 3/4 x 8 1/2, 72 pp., 1963, $2.95, Prentice-Hall, Inc., Englewood Cliffs, N. J. 07632.

In simple words and instructive pictures, describes currents, circuits, generators, and motors, and the many ways electricity and electronics are so important today. Also, includes some safety hints, and three easy projects on making a conductor tester, a switch, and an electromagnet.

573. *A FIRST ELECTRICAL BOOK FOR BOYS, Alfred P. Morgan, P, S, 6 1/2 x 9, 280 pp., 1963, $4.95, Charles Scribner's Sons, New York, N. Y.

Text, diagrams, and drawings are skillfully designed to give the young reader a fundamental understanding of electricity and its uses.

574. *THE BOY ELECTRICIAN, Alfred P. Morgan, P, S, 5 1/2 x 7, 407 pp., 1962, $3.95, Lothrop, Lee, and Shepard, 419 Park Avenue, New York, N. Y.

A guide to practical electricity and radio, including plans and drawings for home construction.

575. ELECTRICITY IN THE HOME AND ON THE FARM, F. B. Wright, 3rd Edition, S, PS, 6 x 9, 380 pp., 1950, $3.98, John Wiley and Sons, Inc., 605 Third Avenue, New York, N.Y. 10016.

Written for those who wish to gain a practical knowledge of electricity and its applications in the home and on the farm.

576. RURAL ELECTRIFICATION, J. P. Schaenzer, S, PS, 6 x 9, 382 pp., 1955, $3.75, The Bruce Publishing Company, Milwaukee, Wis.

(More on this item on next page)

The book is a comprehensive treatment of electricity and electrical mechanisms as applied to present day farm appliances. Each chapter relates to a subject, and is organized in terms of teaching as: discussion, equipment, demonstrations, practice and problems, information and suggested reading.

577. *FARM ELECTRIFICATION REFERENCE, Materials and Teaching Aids, Roy R. Smith, Division Sales Manager, Pennsylvania Electric Company, 1001 Broad Street, Johnstown, Pa. 15907.

This manual is divided into six sections on dairy, poultry, farm crop, horticultural, and general livestock enterprises, and common ground units.

578. PRIMER OF LAMPS AND LIGHTING, 2nd Edition, S, PS, 6 1/2 x 9 1/2, 241 pp., 1965, $6.00, Sylvania Electric Products, Inc., Central Advertising, 1100 Main Street, Buffalo, N. Y.

The book is used in training lamp and fixture salesmen, but is useful as a reference at the high school level. Topics are basic points of electrical theory, light and lighting terms, construction and characteristics of incandescent lamps, operation of fluorescent lamps, mercury lamps, other light sources, light meters, lighting principles and calculations, using the lighting slide rule, examples of lighting layouts, and lighting in your home.

579. *COMPETITIVE REFERENCE MANUAL, S, PS, 1964, $7.50 (without binder) Southeastern Electric Exchange, 270 Peachtree Street, N.W., Atlanta, Ga. 30302.

Fingertip information on advantages of electricity over other forms of energy for drying, heating, post lights, cooking, water heating and air conditioning.

580. NFPA HANDBOOK OF THE NATIONAL ELECTRICAL CODE, Frank Stetka and Merwin M. Brandon, S, PS, 5 3/8 x 8, 640 pp., 269 illustrations, based on 1965 Code, $12.75, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

This handbook, sponsored by the National Fire Protection Association, may well replace Abbott's National Electrical Code Handbook. In the 1965 Code, there are nearly 300 changes which are thoroughly described in this guide.

581. NATIONAL ELECTRICAL CODE, latest edition, PS, 5 x 7 1/2 printed, 434 pp., 1965 Code, $1.00, National Board of Fire Underwriters, 222 West Adams Street, Chicago 60606, or National Fire Protection Underwriters Association, 60 Battery March Street, Boston, Mass. 02110.

582. *WIRING SIMPLIFIED, H. P. Richter, S, PS, 5 1/2 x 8 paperback, 128 pp., 1965, 1-9 copies $0.75 postpaid and remittance sent with order, Park Publishing, Inc., P.O.Box 5527, Minneapolis, Minn. 55408.

Basically a how-to book with emphasis on the reasons why things are done in specific ways. It will serve instructors teaching electricity to vo-ag classes as well as electricians.

583. *WIRING MANUAL FOR FARM AND HOME, A. Carl Bredahl, PS, 5 1/2 x 8, 222 pp., 1957, $4.95, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

How to analyze the electrical requirements of various types of applications and plan systems is clearly shown. The step-by-step procedures given include appliances and lighting, and their respective loads. How to determine feeder sizes, branch circuits, and number and type of outlets is explained for three different degrees of electrification, or sizes of wiring systems.

584. ELECTRICAL ESTIMATING, Ray Ashley, revised 3rd edition, PS, 7 1/4 x 9 7/8, 435 pp., 1966, $15.00, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

Includes illustrations, charts, and tables to show how to prepare accounts and accurate estimates, figure duration costs, check pricing, make estimating drawings, prepare title sheet, plan and divide work, develop labor units, and explain questions and answers.

585. REMOTE CONTROL WIRING, LIGHTING CONTROL CONCEPTS FOR ARCHITECTS AND ENGINEERS, S, PS, 8 1/2 x 11 printed, 44 pp., 1963, $1.00, General Electric Company, Wiring Device Department, Providence, R. I. 02907.

This manual is for designers of electrical wiring for office buildings, schools, and commercial buildings.

586. ELECTRICAL EQUIPMENT MANUAL, McPartland and Novak, PS, 6 x 9, 179 illustrations, 281 pp., $6.50, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

Comprehensive coverage of facts on a multitude of electrical equipment in electrical construction and maintenance. Sketches are captioned for easier understanding of how devices operate.

587. *LIGHTING HANDBOOK FOR INDUSTRIAL ARTS CLASSES, S, PS, 6 x 9, 112 pp., 1963, $1.00, Better Light Better Sight Bureau, 420 Lexington Avenue, New York, N.Y. 10017.

Prepared especially for industrial arts teachers, this manual covers light, lighting, the seeing processes, and methods for teaching about light and sight.

588. *RESIDENTIAL WIRING HANDBOOK, PS, 5 1/2 x 8 1/2, 32 pp., $0.25, 1954, Industry Committee on Interior Wiring Design, Edison Electric Institute, 750 Third Avenue, New York, N.Y. 10017.

It is a booklet on how to plan an adequate wiring system. (The purpose of the National Electrical Code is to establish minimum safety standards for a hazard-free system.) Adequacy and efficiency must be planned.

589. LIGHTING HANDBOOK, 4th edition, S, PS, 8 1/2 x 11 1/2, approx. 575 pp., 1966, $15.00, Illuminating Engineering Society, 345 East 47th Street, New York, N. Y. 10017.

The 25 sections giving the latest information on lighting practices include the physics of light; light sources and control; interior lighting design; roadway, aviation, transportation lighting; residential lighting; and others.

590. LIGHTING EDUCATION, S, PS, 1959, 42 pp., $1.00, Illuminating Engineering Society, Publications Sales Office, 345 East 47th Street, New York, N. Y. 10017.

For secondary school students, but equally good for adults interested in basic knowledge of light and light control. The information supplements physics or science texts with twelve laboratory experiments specifically on light and lighting, easily performed with minimum equipment.

591. ELECTRICIANS' PRACTICAL LIBRARY, 5 volumes, S, PS, 2415 pp., 1481 illustrations, $31.95, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

The five volumes are electrical circuits; mathematics for electricians, 3rd edition; practical electrical wiring, 5th edition; electrical machines; and controllers for electric motors, 2nd edition.

**Educational Level Code**

P -- Primary School (Elementary grades)
S -- Secondary School (Junior and senior high)
PS -- Post Secondary School

* Indicates items that are in FEC Library, and which may either be reviewed there or borrowed free by FEC members.

## Bulletins and Circulars

601. *FUNDAMENTALS OF GOOD LAMP BUILDING, P, S, 8 1/2 x 11 litho., 8 pp., Rural Sales Section, Alabama Power Company, 600 North 18th Street, Birmingham, Ala. 35202.

Gives good and bad examples of lamps and lighting, and discusses what factors make for a good reading lamp. It gives detailed instructions for making one, and for the selection of the proper bulb. Makes suggestions for shade selection.

602. *IMPROVING STUDY LIGHTING, Circular E-785, Lucille A. Clark, P, S, 6 x 9 printed, 16 pp., 1966, Cooperative Extension Service, Oklahoma State University, Stillwater, Okla. 74074.

This is a well illustrated and easy to understand circular on study lighting. It shows many correct and incorrect situations.

603. *CHOOSING AND USING PORTABLE LAMPS, Leaflet 772, Lucille A. Clark, S, 6 x 9 printed, 16 pp., 1966, Cooperative Extension Service, Oklahoma State University, Stillwater, Okla. 74074.

A good circular to use when preparing portable lamp demonstrations; gives a complete treatment of understanding, selecting, and applying portable lamps. Includes some 30 illustrations with appropriate dimensions.

604. *LIGHTING FOR BETTER LIVING, P, S, 4 x 9 folded leaflet, free, Better Light Better Sight Bureau, 750 Third Avenue, New York, N. Y. 10017.

This is a list of Better Light Better Sight Bureau supplementary lighting program study materials.

605. *WORKING WITH LIGHT, P, S, 4 x 9 folded leaflet, free, Better Light Better Sight Bureau, 750 Third Ave., New York 10017.

A listing of programs of supplementary study materials suitable for use in industrial arts and vocational education classes, and in 4-H groups.

606. *FARM ELECTRIC MOTORS, reprint from Electricity on the Farm, S, PS, 6 1/2 x 9 1/2, 16 pp., 1960, 1-9 copies 25¢, 10-199 copies 20¢, 200 or more 15¢ each, Book Department, Electricity on the Farm, 466 Lexington Avenue, New York, N. Y. 10017.

This seven-part publication gives information on selection of motor types, size, connections, wiring, protection, care, and maintenance.

607. *SINGLE-PHASE ELECTRIC MOTORS FOR FARM USE, Farmers' Bulletin #2177, S, PS, 6 x 9, 24 pp., 1964, U. S. Department of Agriculture, Washington, D. C. 20250, or local County Extension Service Office.

Subject matter includes types, selection, installation, motor protection, control, and servicing.

608. *ELECTRODES FOR FARM ARC WELDING, Circular Ae69, S, PS, 8 1/2 x 11, 8 pp., 1962, Extension Service, North Dakota State University, Fargo, N. Dak. 58102.

This bulletin explains the AWS-ASTM Classification of Arc Welding Electrodes, discusses the types of electrodes to be used for various welding jobs, and lists some of the manufacturers and their brand names.

609. *TEACHERS GUIDEBOOK FOR LIVING WITH LIGHT, P, 8 1/2 x 11, 8 pp., 1963, Better Light Better Sight Bureau, 750 Third Avenue, New York, N. Y. 10017.

Contains suggestions for the use of the Bureau's filmstrips, study leaflets, and other component parts of a study project on light and sight.

610. *EDUCATIONAL MEDIA INDEX, Industrial and Agricultural Education, 7 x 11, 268 pp., 1964, McGraw-Hill Book Company, 330 West 42nd Street, New York, N. Y. 10036.

Listed and carefully classified are educational visuals, such as films, kinescopes, filmstrips, flat pictures, slides, transparencies, and videotapes. Information on charts, graphs, maps, etc., is available from the same source.

611. *ELECTRICAL SAFETY LEAFLETS, Electrical Farm Safety Committee, P, S, 8 1/2 x 11 folded, limited supply, one copy free, Farm Sales Department, Connecticut Light and Power Company, P.C.Box 2010, Hartford, Conn. 06101.

Leaflets point out safe practices.

612. *ELECTRIC FARM POWER QUARTERLY, S, PS, 8 1/2 x 11, 4 pp., published quarterly, write for availability information, North Dakota Power Use Council, c/o Agricultural Engineering Department, North Dakota State University, Fargo, N. Dak. 58102.

These leaflets present application and understanding information about the use of electricity in the home and on the farm. Give good references suitable for 4-H, vocational agriculture, and vocational technology use.

613. *SAFETY GROUNDING, S, PS, 8 1/2 x 11, 4 pp. fold, one copy free, Rural Sales Section, Alabama Power Company, 600 North 18th Street, Birmingham, Ala. 35202.

Based on the 1962 National Electrical Code, with references to it by paragraph number. Revisions, including Code changes, will be made when the present supply is exhausted.